AMERICAN VETERINARY REVIEW,

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EDITORIAL.

"UNEASY LIES THE HEAD THAT WEARS A CROWN."—How often must this Shakesperian adage quote itself to the "mind's *ear*" of our friend, the worthy Chief of the Bureau of Animal Industry, and how often he must wish that his work, or that of his assistants, might be of less importance, and create less interest amongst veterinarians or others, who, for purely scientific reasons, are carefully watching the manner in which he is meeting his responsibilities, and how commendably he exerts himself to accomplish, in a manner satisfactory to all, the trust reposed in him.

In an account of the last "Echoes of the Convention," of the United States Veterinary Medical Association, it was wisely remarked "that the Bureau seemed to be the friendly target of all chairmen and some essayists"; but true as this is, the Chief of the Bureau, Dr. E. Salmon, is always on the alert, able to defend himself, and ready with a reply to all objections alleged against himself personally, and his records, or those of the Bureau staff.

In our present issue we publish a reply from the Doctor to some of the criticisms made by the chairman of the Committee on Intelligence and Education, Dr. A. Peters, in his report, and to render the matter more intelligible we insert below an extract from the report itself, without waiting for the publication of the entire transactions of the meeting, to be printed in compliance with the vote of the Association. Our

readers will therefore be enable to perceive the drift of the remarks without embarrassment.

Extract from Dr. Peters' Report.

In concluding this report, I believe that the Bureau of Animal Industry should receive a little of our attention. I thought of calling your attention to it a year ago, but my paper then seemed so long that I decided to defer what I had to say until a future occasion, and am now glad that I did so, as it has given me an opportunity to beard the lion in his den, so to speak, which I always prefer to do, if the opportunity permit.

We have connected with the United States Department of Agriculture the Bureau of Animal Industry. Its chief is a veterinarian, and a large number of his assistants are also veterinarians. It is the only department in which the United States Government officially recognizes the veterinary profession in a manner that at all appeals to our self-respect, and as the great veterinary organization of this country, we naturally take much interest in its work and usefulness. We are better able, perhaps, than anyone else to criticise its actions and results, being, as we are, specially educated on the subjects with which it has to deal. We have the same right as the rest of the people to commend the action of our servants, or to find fault with the way in which they conduct their work, besides which, by our special training, we are in a position to feel that we have a peculiar right to show our approval, or our disapproval, as the case may be, of the labors of this Bureau.

Of the practical work of the Bureau of Animal Industry I shall have little to say. It has almost eradicated contagious pleuro-pneumonia from this country, and in time will undoubtedly succeed in its complete extinction. For this service alone it deserves the thanks of the people, and has repaid many times over every cent that has ever been appropriated by Congress for its support, including all it has expended in other directions. These results could have been obtained by any good veterinarian possessed of tact and administrative ability. When we come, however, to a consideration of its scientific investigations, we cannot say a great deal for its efficiency.

If we review as briefly as possible the work done in the scientific investigations of swine diseases by the Bureau of Animal Industry, it will be quite sufficient to demonstrate to us the value of its bacteriological work and the credence to place upon any statements emanating from its officials.

If an exhaustive report were written upon the researches in swine diseases in the United States during the past few years, together with all the controversy that they have brought forth, quite a large volume could be easily filled. A year ago, when I thought of referring to this matter in my report, I should have based what I had to say upon an article by J. Amory Jeffries, M.D., which appeared in the *Journal of Comparative Medicine and Veterinary Archives*, for December, 1890, entitled "Etiology of Two Outbreaks of Disease Among Hogs." Although my report was written before the article appeared in print, I was fully cognizant of its contents, having assisted Dr. Jeffries with the work, and in fact done a portion of it myself. Material which I have since been able to avail myself of only confirms me in the views which I then held, without changing them in any important particular.

The other articles of which I speak, and to which I would refer all interested in the matter, as time will only permit of my presenting the conclusions I have drawn from them, are:

"A Contribution to Our Knowledge of the Cause of Swine-plague, and its Relation to Connected Bacteriological Operations," by Dr. P. Frosch (Zeitschrift fûr Hygiene, vol. 9, page 235). Editors, Dr. R. Koch and Dr. C. Flugge.

"Upon Our Knowledge of the American Swine-plague," by Dr. Theobald Smith, Chief of the Bacteriological Laboratory of the Bureau of Animal Industry. (Zeitschrift fûr Hygiene, vol. 10, No. iii, page 480.)

"Reply to the Preceding Work of Dr. Th. Smith, upon 'Our Knowledge of American Swine-plague,'" by Dr. P. Frosch, Assistant in the Institute of Hygiene of the University of Berlin. (Zeitschrift fûr Hygiene, vol. 10. No. iii, page 509.)

Also at a meeting of Scottish Metropolitan Veterinary Medical Society, held in Edinburgh, February 25th, 1891, Mr. Thomas Bowhill, M.R.C.V.S., read a paper upon "Swine Fever." Vide *Veterinary Journal*, May, 1891. To sum up:

Jeffries concludes that Billings' "Swine-plague," and Smith's "Hog Cholera" germs are identical, and differ from those of the disease he has investigated; and that cultures Smith sent him of his "Swine-plague" germ are identical with the disease germs that he (Jeffries) has been studying, which produce a septic pneumonia in swine that they can communicate to calves, and very probably to lambs, sheep and other animals.

In short, the much-vaunted "Swine-plague" is simply a septic direase which is not peculiar to swine by any means. It is caused by one of a large group of bi-polar organisms, capable of producing similar symptoms in such small experiment animals as are susceptible to them. Jeffries concludes by saying: "But while two germs of this class are known to infest hogs in the United States, there may be others in Europe, *e. g.*, 'Wild seuche.'"

I think that Jeffries' work is particularly accurate and very valuable, and am surprised that it has not attracted a great deal of attention, although it does not seem to have done so.

Dr. Frosch, in his first article, compares the work done by Billings with the work supposed to be Salmon's, and draws the following conclusions:

1.—"The bacterium of Salmon's hog cholera and Billings' swine-plague are identical.

2.—"The same is the cause of the American swine-plague, while the proof of an etiological relation of the bacterium of Salmon's swine-plague to the first, especially to a second plague of like extent, has not yet been sufficiently demonstrated.

3.—"That the bacterium is identical with Selander's schweine-pest bacterium" (Selander's schweine-pest being the swine disease of Sweden and Denmark), "but different from the bacterium of the German schweine-seuche, chicken cholera, rabbit septicemia and ferret plague.

4.—"The ferret disease is caused by a separate kind of bacterium, and cannot be grouped with the rest."

Dr. Smith's is a reply to Dr. Frosch's first article.

Dr. Frosch's second paper is a reply to Dr. Smith.

Dr. Bowhill's paper announces that he has found in cases of swine fever, in England, a bacterium identical with Billings' swine-plague germs, and that he has sent specimens to Billings, who confirms his discovery.

Here we have two excellent investigators, one in the United States and one in Germany, confirming the identity of Billings' swine-plague germ and Salmon's hog cholera germ, and each one acting independently of the other, while the third finds the same germ as the cause of the English swine fever.

Dr. Billings boldly announces that he found his germ of swine-plague in July, 1886, among the first pigs that he examined in Nebraska, which had died of the disease.

Salmon, in his report for 1884, discovered a micrococcus as the cause of what he then called swine-plague. In his report the next year he says it is due to an oval, motile bacterium. Later in some of his replies to his critics he attributes the discovery of this organism to his assistant, Dr. Th. Smith. Dr. Frosch says: "This circumstance not only readily explains the intrinsic contradiction of the reports for 1884 and 1885, but also seems to have influenced Salmon's further investigations."

In a special report of the Bureau of Animal Industry upon "Hog Cholera: Its History, Nature and Treatment," issued in 1889, there is a short history of the investigations of swine diseases made in the United States, but we do not find any mention of the name of Billings, although he discovered at once the bacterium for which the Chief of the Bureau of Animal Industry had been searching for years, and which he probably would not have found for some time if he had not had the help of an assistant whom he was not generous enough to credit with the discovery, and so let it pass as his own.

In the report of the Bureau of Animal Industry for 1886, page 20, we find the following statement:

"In view of the results of investigations which have shown the existence of two distinct infectious diseases of swine, perhaps of equal virulence and distribution, a change in the nomenclature becomes necessary in order to avoid any confusion in the future. Since these two diseases have been considered as one in the past, and the name swine-plague and hog-cholera have been applied indiscriminately, we prefer to retain both names, with a more restricted meaning, using the name hog-cholera for the disease described in the last report as swine-plague, which is produced by a motile bacterium, and applying the name swine-plague to the other disease, the chief seat of which is in the lungs. This change is the more desirable since recent investigations have shown that the latter disease exists in Germany, where it is called swine-plague (schweine-seuche.)"

The following questions propound themselves to us after reading the above:

After speaking of the disease as swine-plague for several years did the Chief of the Bureau of Animal Industry call Billings' swine-plague, "Hog Cholera" for the sake of creating confusion? (Thus while apparently ignoring him, at the same time paying him the greatest possible compliment in the power of one man who seems to so admire another.)

If the name "Hog-cholera" was not used in place of swine-plague for the purpose of creating confusion, why was a septic pneumonia of the pig termed "Swine-plague," unless it was for the purpose of causing still further confu-

sion? when, as we have seen, the disease is not confined to swine, but a little careless study would have shown that pigs could easily communicate it to other species of animals. Dr. Frosch pays the methods of bacteriological study pursued in the laboratory of the Bureau of Animal Industry the deservedly high compliment of doubting any "etiological relation of the bacterium of Salmon's 'Swine-plague' to the pest, especially to a second plague of like extent."

But Jeffries' work removes all doubt upon this matter, and we know that the Bureau of Animal Industry has found another disease of swine, which is a septic pneumonia, and is not alone confined fo swine, and which for some reason or other they choose to term "Swine-plague." Furthermore it is not impossible that one animal may be infected with both maladies simultaneously.

The so-called swine-plague of the Bureau of Animal Industry is one of those septic diseases due to filth, and is seen chiefly where putrefying city swill is fed, and farmers around Boston find that if the swill is boiled and then fed before there is time for putrefactive process to commence again, that they are not troubled with it. In this respect it resembles closely the German schweineseuche. If this be a true swine-plague, make the most of it.

Dr. Smith's article is, as I have said, in reply to Dr. Frosch's first article. In it he attempts to uphold the work done under the auspices of the Bureau of Animal Industry, and to throw discredit upon the work done in Nebraska, and also to answer the criticisms in Dr. Frosch's first article.

Dr. Frosch's reply to Dr. Smith has its chief interest in his closing sentences. After briefly answering Dr. Smith's remarks, and saying that there is no need of his defending Dr. Billings, as he is abundantly able to defend himself, Frosch ends with: "From the present publication of Smith's, however, which could not be seen in reading the reports of the Bureau of Animal Industry, it is evident that Salmon was not the discoverer of either the 'Hog-cholera' germ or that of the 'Swine-plague,' so now we know the condition of things in that regard."

Whether Frosch's feelings of admiration for the honesty and generosity of the pseudo-scientist whose work he supposed he was reviewing when he wrote his first article, were equal to his feelings of pity and contempt for the assistant who was obliged to give the credit for his hard work to his chief, or lose his official head, and yet serve as a pillar for his doughty chief to hide behind in case of an attack, I leave to your imagination.

You will see that Jeffries in his paper gives Smith the credit for the work he has done. It has been no secret to me for the last year and a half as to who was actually conducting these investigations in the Bureau of Animal Industry. Having taken the investigation of swine diseases as a fair sample of this Bureau's scientific labors, are we to be expected to place any dependence upon the accuracy of the statements emanating from its officers concerning such work, especially when they conflict with the results obtained by men like Paquin and Billings, unless the work of the former is confirmed by experiments conducted by independent and unprejudiced observers of recognized ability?

How can we as a profession feel anything but disgraced when we think of the opinions which must be held in Koch's laboratory, the greatest bacteriological laboratory in the world, concerning our Bureau of Animal Industry and its scientific work?

I do not wish anyone to think that I have taken up the cudgels in Dr. Billings' behalf. Scientific research is the search after truth, and work that is recognized as good abroad cannot be ignored at home, no matter what the personal feelings of one man may happen to be towards another. No one deplores more than I the personalities that so often pervade the writings of the investigator employed by the State of Nebraska, that have done so much to detract from the dignity of his work, which I believe to be really correct and valuable; and it must be borne in mind that blackguardism does not add to the weight of argument. On the other hand a lack of honesty and straightforwardness is equally bad, or worse, and modern political methods are not to be tolerated in the conducting of scientific researches.

The former style of writing shows what it is on the face of it. The latter often hides a good deal beneath its surface. One is like the rattlesnake, which gives warning when it is about to strike. The other is more dangerous, like the deadly moccasin, which strikes its fangs into its victim without giving any indication of its presence.

If the Bureau of Animal Industry is to be a political organization, why not have its chief simply write the letter of transmissal of his annual report to the Secretary of Agriculture, and have a few true scientists in its employ to work unhampered, and make their own reports upon the questions that they have been studying upon. This at least for the sake of making a more creditable appearance to other civilized nations, if we have no respect for ourselves.

More could easily be added of adverse criticism upon the management of the Bureau of Animal Industry, but enough has been said for the present, and it does not seem advisable to continue this report to too great length.

In conclusion, I wish to heartily express my thanks to my confrères upon this committee for the valuable assistance they have rendered me in obtaining material for this report.

ACTINOMYCOSIS AND UNITED STATES MEAT INSPECTION.—One of the most important trials in which questions of veterinary sanitary science have been involved, has taken place lately in the Circuit Court of Peoria, Ills., and through the kindness of one of our editorial associates we are enabled to give in the present number not only a report of the trial, but also some criticisms upon the testimony of one of the leading witnesses. These criticisms may be considered severe, and out of place in the REVIEW, but still, as the testimony and its conclusions are public property, their publication ought not to be considered as influenced by motives of a personal nature, so much as of professional interest. The remarks of our associate are appended;

The suit of Greenhut *vs.* Pearson, briefly outlined elsewhere in this issue, wherein Greenhut as chief plaintiff brought

action against the Live Stock Commissioners of Illinois for the sound beef value of one hundred and twenty-five distillery cattle affected with actinomycosis, and "tanked" at the instance of the Commissioners, has unavoidably caused a greatly increased interest in the subject of meat inspection, especially as to the attitude of the Bureau of Animal Industry toward the disposition of the meat of animals affected with the disease in question, so far as it relates to inter-state or international food supply.

As a leading witness for the plaintiffs, Dr. R. W. Hickman's evidence in the witness box might be taken as expressing the views of his bureau, were it not for the fact that his testimony flatly contradicts the official assertions of the Secretary of Agriculture, under whose auspices meat inspection is carried out. It is utterly impossible to harmonize Secretary Rusk's official assertions with the sworn testimony of Dr. Hickman, who, as chief inspector at Chicago, the most important meat inspection point in the country, is virtually chief meat inspector.

Secretary Rusk, in his third annual report, dated October 27, 1891, says on page 14: "In most, if not all European countries, inspectors, according to their reports, freely pass for consumption the meat of animals affected with foot-and-mouth disease, pleuro-pneumonia, localized tuberculosis, actinomycosis, and similar diseases, which, according to the views and customs of this country, must be condemned. But all the meat for the foreign market is inspected the same as that for home consumption."

A few days later, his chief meat inspector at Chicago, the leading meat inspection point in the nation, deposes as follows:

Q. (By counsel for plaintiff's, Mr. Stevens.)—Suppose an animal had an ulcer upon the jaw that was not running; was in good condition; had taken on fat rapidly and was thrifty, and was killed and the head thrown away. To what extent would the meat of such an animal be at all injurious for food? A.—I do not consider it would be.

Q.—State whether under these circumstances the partaking of that food could possibly carry the disease to any of the human family that partook of it? A.—No, sir.

Cross-examination by Counsel for Defendants.

Q.—You have in your professional capacity rejected at times fat cattle for export, on the ground that they were not fit for consumption, have you not? A.—I have rejected them on general appearance for post-mortem examination.

Q.—Suppose they were a fat, hearty-looking lot of cattle, why would you reject them? A.—For the reason I have just given you: subject to post-mortem investigation, so I could see.

Q.—When did you attend the first post-mortem examination of an animal affected with actinomycosis? A.—In Chicago, soon after I came there. [1890.—W.] * * *

Q.—I mean, how many (examinations) have you made yourself, through the microscope, of a section of an actinomycotic tumor that came from different animals? A.—I think three.

Q.—That makes four in all during your life? A.—Of different animals—yes, sir. * * *

Q.—As a matter of fact, then, have you ever examined microscopically any sections from the internal organs of animals afflicted with this disease, to ascertain the presence or absence of these actinomyces? A.—Not specially. * * *

(Last question rejected.) Q.—What limitation do you desire to make to your former answer? A.—I want to express the idea that *I would not reject it* (carcass of actinomycotic animal) *simply because it had actinomycosis*, but I would reject an animal as unfit for food on general grounds, whether from an actinomycotic tumor or any other tumor that had drained the system.

Q.—Would you consider a fat animal, with a tumor that was discharging pus, as fit for human food? A.—If the animal was in a thrifty condition—yes, sir.

Q.—Have you ever made an examination upon an animal where the actinomycotic tumor was apparently healed, to ascertain whether or not there were any lesions or tumors in the internal organs containing these actinomyces? A—I have no doubt there are lesions in the internal organs where the tumor on the animal has healed. *I recall no case where I have made a special examination*, but I have no doubt that it is a fact.

This evidence shows a grave want of accord between Dr. Hickman and Secretary Rusk, for while the latter says animals affected with actinomycosis *are* condemned, the former swears positively that he *would not* condemn an animal at all for the disease, and that he does not condemn them, but merely rejects them for live export. Why? Dr. Hickman has not answered, but it is presumably because he knows that European countries raise all that kind of beef at home that they desire. What becomes of these rejected cattle does not plainly appear, but the only logical conclusion to be drawn is that under Dr. Hickman's orders these rejected cattle (which are actinomycotic but to his mind healthy for food) are

slaughtered, and the more patent evidences of disease obliterated, when the remainder of the carcass is passed as healthful food for national and international trade. Yet Dr. Hickman admits that the disease is transmissable, that it may invade various organs, that he never made a critical examination of a carcass to see what organs, and that ordinarily he was not furnished with a microscope of sufficient power to identify the actinomyces.

As chief inspector at the chief meat inspection point in the United States, his ignorance is utterly amazing. Chief inspector at Chicago, yet has never made a study of actinomycosis; has made no critical post-mortem examinations of affected animals; has made microscopical examinations from tumors of about three cattle; does not know what organs or tissues, of either animal or man, become affected, and has taken no measures to learn; has practically seen the disease only in or about the head; considers a live steer with an actinomycotic tumor attached unfit for export, but the same steer decapitated as perfectly healthful as food for native or foreigner! Dr. Hickman apparently considers his highest duty as a meat inspector to be to make meat *appear* healthy by obliterating the evident signs of disease, a position which is conspicuous mainly for its lack of honesty.

When Dr. Hickman returned to Chicago, after his above-related testimony, he is reported to have expressed himself as very solicitious that the plaintiffs should win, and thus force actinomycotic meat upon the market, lest that, should the jury decide the disease contagious, it would ruin our export trade. In what? Actinomycotic meat? If Dr. Hickman was at all acquainted with the literature of actinomycosis, he would know that the decision of a petit jury in this case would not alter the views of Crookshank, Fleming, Johne, Israel, Ponfic, and others who have given the disease a thorough study. We have more right to fear that our export cattle trade will be seriously crippled by the most important meat inspector in the country going into the witness-box in a case of international interest, and testifying that he cuts off cattle's heads to obliterate evidence of disease before export-

ing the carcass, and admitting at every turn the most abject ignorance possible of the probable relation of actinomycotic meat to human health, and all this notwithstanding the positive official declarations of Secretary Rusk that the carcasses of these animals *are condemned* and excluded from both home and foreign markets.

The Chicago *News* for November 21 contains an alleged interview with Dr. Salmon, Chief of the Bureau of Animal Industry, in which he fails to take any positive stand in the matter, but suggests that the danger is overestimated, and the words attributed to him might readily be construed to mean that in our present knowledge he believes that until a tumor has gained large dimensions and is discharging pus, the meat is fit for food. A positive conclusion can not, however, be drawn as to his exact stand, but the above suggestion is the position held by many. It is a very peculiar position for anyone to occupy, as, leaving out the thought of danger from the contained living micro-organisms, it is very difficult to understand why a *discharging* tumor, from which the pus is promptly evacuated after formation, or a tumor we may say which *has contained* pus, renders the meat of the carcass unfit for food, while a tumor *containing* pus renders it healthful.

Certain occurrences in connection with the trial further lead us to ask:

In whose interest should meat inspection be made?

Were we to judge the matter from the standpoint of Drs. Hickman and Billings, we would have to conclude that meat inspection is a process designed to secure to the producer a sale for his meat regardless of the consumer's wishes or health.

The public press, at the date of the trial, was also well filled with news of how many telegrams of encouragement and sympathy the plaintiffs were receiving from cattlemen throughout the West. We have no doubt that there are many cattlemen who would like to sell these actinomycotic animals for food, but a careful canvass among these same cattle raisers would show but few of them who care to eat the flesh of such animals themselves.

We have all along contended that meat inspection should be made in the interests of the meat consumer, and that they are the parties to be satisfied and not the cattle raiser.

When we ask a butcher for *beef* we should not be served with mule meat; and when we ask and pay for sound meat we should not receive that from an animal affected with actinomycosis, unless we believe such meat to be really *sound.*

Persons who object to the meat of animals affected with actinomycosis being sold upon the general market would not, as a rule, object to its being sold for what it really is—but the seller insists that it shall be sold for what it is not. So Dr. Hickman believes these carcasses healthy, yet he refuses to place this meat upon the market on foot, with the evidence of the disease perfectly patent, but excises the principal disease-marks, pleases the seller and deepens the ignorance of the consumer of meat as to what he is eating.

There seem to be two ways by which this meat can go upon the market in a satisfactory manner to most consumers.

First; To be officially labeled and sold as meat from animals affected with actinomycosis. Second; Such meat, after destroying the evidently affected parts, to be thoroughly cooked under official supervision, and then sold as sound meat. One of these propositions should prove satisfactory to sellers, but there are men among them who desire to reap the highest market price for this beef, which they would not knowingly eat themselves but think it sufficiently good for others, especially *if the tumors are removed, and Hickman and his colleagues say it is healthful, and the consumer rendered wholly ignorant.*

We have great faith in the good intentions of the highly esteemed Secretary of Agriculture, and believe that he, in conjunction with Dr. Salmon, is trying to secure reliable meat inspection, but when Dr. Hickman comes into court and testifies as he did in Peoria, had Secretary Rusk been present and heard him he would have preferred in the future to buy his table meat from carcasses free from Hickman's brand.

W.

ILLINOIS VETERINARY MEDICAL ASSOCIATION. — The worthy Secretary of this body has furnished us with a report

of the last meeting of the Association, with the announcement that the papers read at the meeting will soon be forwarded to us for publication. We thank our co-laborers for so kindly remembering the REVIEW, and regret that the crowded condition of our pages precludes the possibility of our giving the entire transactions in the same manner as we have done on previous occasions. Our friends in Illinois, however, are aware that it is only from lack of the opportunity to do so that we have failed to print their proceedings in full, and the hospitality of our columns is always tendered to their favors.

ORIGINAL ARTICLES.

REPLY TO DR. AUSTIN PETERS' CRITICISM.

BY DR. D. E. SALMON, Chief of the Bureau of Animal Industry.

At the meeting of the United States Veterinary Medical Association, held in Washington on September 15th and 16th, 1891, a meeting from which the writer was unavoidably absent, Dr. Peters, as Chairman of the Committee on Intelligence and Education, presented a report in which he bitterly assailed and criticised the Bureau of Animal Industry, and especially the writer, as the Chief of that Bureau. This report has since been published, and has, no doubt, been perused, in whole or in part, by the readers of this journal; at any rate, it has been spread before the world as being the deliberate statements of one of the most important committees of our national veterinary organization. The assertions contained in it are of such a nature that they cannot be allowed to pass unnoticed, either by the individual whose name and reputation are involved, or by the Association before which the charges were so publicly made.

If Dr. Peters' report is true, then the writer of this communication is an unworthy member of the Association; if it is false, then the Chairman of the Committee on Intelligence and Education is guilty of unprovoked, deliberate and malicious slander. In either case, the self-respecting members

of the Association cannot allow the matter to stand without taking some positive action. To act intelligently they must have both sides of the controversy before them, and I have consequently prepared this reply to Dr. Peters' statements, which I shall send for publication to the two veterinary periodicals of the country.

All will agree with me, no doubt, that a person who is assailed in such language as appears in Dr. Peters' contribution, should, in common fairness, be accorded an opportunity to make a reply before he is condemned, even if there was nothing at stake but his individual reputation. And when, as in this case, there is, in addition to individual honor the reputation of a great Bureau of the National Government, a Bureau on the force of which the veterinary profession has always been largely represented, how much greater reason is there for expecting the fullest hearing and the most unbiased treatment.

Dr. Peters, in his paper, endeavored to give the impression that he boldly made these charges in my presence, since he says that he is glad that he has deferred the matter until this year, "as it has given me [him] an opportunity to beard the lion in his den, so to speak, which I [he] always prefer to do, if the opportunity permits." Instead of this being the case, he seized the opportunity when he knew I was unavoidably absent in Europe, representing the Secretary of Agriculture at the International Congress of Hygiene and Demography at London, and at the International Agricultural Congress at The Hague, to make an attack, not only on the scientific work of the Bureau, but upon my honesty and truthfulness. This attack was the more cowardly since he also knew that Dr. Smith, who has charge of the investigations, was not a member of the Association, and was, therefore, not in a position to reply.

It should be remarked, in this connection, that Dr. Peters has adopted three lines of attack. The first and chief one consists of personalities; the second is the misrepresentation of our views, in order to secure plausible subjects for criticism: while the third and least prominent, is the attempt to

controvert views which we have actually expressed. It is fortunate that this whole subject is a matter of record, and that all the evidence has been printed where it is easily accessible. There is, consequently, no excuse for misrepresentation or inexact statements.

The personalities are chiefly based on the assumption that I have failed to give Dr. Smith credit for the part which he has had in the investigation of swine diseases. "In a special report of the Bureau of Animal Industry upon 'Hog Cholera: its History, Nature and Treatment,' issued in 1889," Dr. Peters says, "there is a short history of the investigations of swine disease made in the United States, but we do not find any mention of the name of Billings, although he discovered at once the bacterium which the Chief of the Bureau of Animal Industry had been searching for for years, and which he probably would not have found for some time if he had not had the help of an assistant whom he was not generous enough to credit with the discovery, and so let it pass as his own."

We will now go to the records and see how much credit has been given to Dr. Smith for the work which he has done. In the report of the Bureau for 1885, page seven, is the following sentence: "I have been ably assisted in these investigations by Dr. Theobald Smith, whose untiring service has been indispensable and invaluable; also by Dr. F. L. Kilborne, who has had charge of the experiment station." In 1886, long before the report for that year was issued, and in order to remove any possible doubt as to the manner in which the investigations were conducted, I published an article in which the following paragraphs occur:

"Very soon after these experiments "[those of 1884] "were made, the many duties which devolve upon me as Chief of the Bureau of Animal Industry made it necessary to place the investigations of hog cholera almost entirely in the hands of my assistant, Dr. Theobald Smith, in whose ability and devotion to the work I had, and still have, the utmost confidence. While, therefore, I marked out the lines of investigation, and kept a personal supervision over what was done, the work has been carried out by another.

"Now one of the very first results of this arrangement was the conclusion by Dr. Smith that hog cholera was caused by a motile bacterium, which certainly was a different germ from the one that I had described in 1884." (Breeders' Gazette, Nov. 11th, 1886).

The very article in which these sentences occur was referred to by Dr. Frosch, and this reference was reproduced by Dr. Peters, so there can be no excuse for either of them to plead ignorance of its contents; and yet, in spite of this plain statement, Dr. Frosch, after mentioning the article, pretends that he did not know until the publication of Dr. Smith's recent paper, the part which the latter (Smith) had taken in the work. And Dr. Peters, taking his cue from Frosch, chimes in with the same order of statements.

This is by no means all the credit that has been given. In the report of the Bureau for 1886, page 7, I said: "For the careful and accurate manner in which the experiments referred to above have been carried out, I am indebted to Dr. Theobald Smith, director of the laboratory, and to Dr. F. L. Kilborne, director of the experiment station, both of whom have shown the most commendable activity and interest in the work, and whose intelligence and zeal have enabled us to satisfactorily decide some of the most difficult questions which modern science has been called upon to elucidate." It will be noticed that although Dr. Smith came to me a young man, I had very soon made him director of the laboratory, and I recognized in my reports not only his work, but the position which he filled. This report for 1886 was the one that contained the first record of his work in connection with the disease which we call swine plague; and we therefore have the most explicit evidence that he received full credit for his work with both diseases.

In the Bureau report for 1887 and 1888, which was published in one volume, I said (page 7): "In conclusion, it affords me pleasure to acknowledge the ability, energy and devotion to work shown by Dr. Theobald Smith and Dr. F. L. Kilborne, in conducting the experimental work, the details of which are given in this report." In the Special Report on

Hog Cholera, mentioned by Dr. Peters in the quotations made above from his paper, occurs the following paragraph:

"The greater part of the detailed study of the disease, the planning of the experiments, and the bacteriological investigations, have been carried out by Dr. Theobald Smith, while the conducting of the experiments, the care of the experimental animals and the general management of the experiment station have been under the direction of Dr. F. L. Kilborne. I can only speak in the highest terms of the untiring industry and skill displayed by both of these gentlemen."

It is unnecessary for me to make further quotations to establish the fact that Dr. Peters was guilty of the most inexcusable misrepresentation and distortion of facts in what he said in reference to this matter. "You will see," he says, "that Jeffries in his paper gives Smith the credit for the work he has done." But why should he not have given him credit? Were not all the facts detailed with sufficient minuteness in the reports, as shown by the above quotations? Again, he says, "It has been no secret to me for the last year and a half as to who was actually conducting these investigations in the Bureau of Animal Industry." Why should it have been any secret to him or to any one else who consulted the reports of the Bureau as to the exact position and work of each one connected with the investigations?

There is one other paragraph in Dr. Peters' paper which I must quote and comment on in this connection. He says: "If the Bureau of Animal Industry is to be a political organization, why not have its Chief simply write the letter of transmissal of his annual report to the Secretary of Agriculture, and have a few true scientists in his employ to work unhampered and make their own reports upon the questions that they have been studying upon. This, at least, for the sake of making a more creditable appearance to other civilized nations, if we have no respect for ourselves."

This is very strong language, calculated and intended to discredit the Bureau and those connected with it, both at home and abroad. The reader will agree with me, I am sure, that it should not have been published broadcast without the

most ample evidence that the imputation which it conveys was fully justified by the facts. No one can have any excuse for being ignorant of the fact that the Bureau of Animal Industry is not a political organization. The law provides that the Chief "shall be a competent veterinary surgeon," thus taking the appointment as far as possible out of the realm of politics. The Chief has no power to make appointments or dismissals, and, consequently, there is no political work for him to do, and no excuse for his being a politician. The present Chief was appointed by the late Dr. Loring in 1884, without any political influence whatever being brought to bear, and solely because of his competency as a veterinary surgeon, and his qualifications to perform the arduous and responsible duties of the position. He has served under three administrations, two of which were Republican and one Democratic, and there has been no effort of any head of the department to displace him, or any of his scientific staff. How different this would have been if the Bureau had been in any sense a political organization.

More than this, I adopted the plan of transmitting the reports of Dr. Smith and the other scientists under my direction as soon as it appeared proper to do so. By consulting the report of the Secretary of Agriculture for 1889, page 75, it will be seen that the report of these investigations is introduced as follows: "The following brief account of the investigations, conducted under my direction, into the nature of infectious animal diseases, has been prepared by Dr. Theobald Smith, who is in charge of this branch of the work of the Bureau of Animal Industry." In the report of the Secretary of Agriculture for 1890, page 105, I have introduced Dr. Smith's report in precisely the same language as that just quoted. After this plan had been adopted by me and carried out for two years, Dr. Peters appears upon the scene and tries to convey the impression that he is the first to suggest it; that it has never been adopted, and that we are deserving of the contempt of other nations and our own people, because it has not been done.

There are other personalities in Dr. Peters' paper which

are equally unworthy of him and of the committee for which he spoke. They might be taken up one by one and shown to be just as uncalled for, just as far from the truth as those which have been considered. I will not weary your readers, however, by going further into this subject, since his whole case hangs upon the assumption that I failed to give Dr. Smith credit for his work in the investigations of swine diseases. This assumption of Dr. Peters is conclusively disproved by the quotations which I have made from my reports, and shown to be without reason or justification; and that being the case, the inferences and insinuations which he bases upon it must necessarily be taken as equally unworthy of belief.

Having disposed of the first line of attack, the personalities, let us briefly consider the second line, that is, the misrepresentations of our views on scientific questions, made for the purpose of introducing plausible arguments for strengthening the weak parts of his paper. It is simply the well-known dodge of polemical writers, generally referred to as setting up straw men for the moral effect which follows from knocking them over.

Dr. Peters quotes from the report of the Bureau for 1886, the passage which explains that we had differentiated two diseases of swine that had previously been regarded as one, and that it was consequently necessary, to prevent confusion in the future, to apply a distinctive name to each, and that, after full consideration, it had been concluded best to call the disease described in the report of 1885 "hog cholera," and that described in the report of 1886 "swine plague," and that this was the most desirable since the latter disease existed in Germany, where it was also called swine plague (schweineseuche). These reasons certainly appear to me to be sufficient for our course, and the man who sees a hidden intent on our part to cause confusion instead of preventing it, must have an extremely suspicious nature. And yet the doctor seriously states that the following questions propound themselves to him after reading our explanation.

"After speaking of the disease as swine plague for several

years" (one year, to be exact.—D. E. S.) "did the Chief of the Bureau of Animal Industry call Billings' swine plague 'hog cholera' for the sake of creating confusion?" If Dr. Peters will refresh his memory as to the literature of the subject, he will find that Dr. Billings' report on swine plague did not appear until June 30, 1888, or a year and a half after the report of the Bureau that he quotes from was written, and that we could not have known in advance what his position would be, or what name he would apply to either disease. In his newspaper articles Dr. Billings asserted most positively that the germ he had found was identical with that described as causing German swine plague (schweine-seuche), and he repeats this in his report (1888) and goes so far as to say (page 136) that "Mr. Salmon's specific 'hog cholera microbe' was missed, and it 'ever will be missed' in the American swine plague, no matter who seeks it, or how much time they may spend in the hunt."

If Billings had been right in this, and his subsequent course had been consistent, there would have been no confusion, for the German swine plague, the swine plague of the Bureau and Billings' swine plague would have been caused by identical germs, and there would have been no confusion in classing the three together as one disease, or as variations of one disease. As far as could be seen, therefore, from the literature at hand at the time our report was written, our nomenclature was calculated to avoid any confusion, even with Billings' writings. We could scarcely be expected to foresee that Billings would discard his swine plague germ (which he asserted was identical in its "micro-morpho-biological phases" (report, pages 113, 114) with the germs of "wild-seuche," hen cholera and rabbit septicæmia), and come to the front with an entirely different microbe as the cause of his swine plague. This other microbe is the hog cholera microbe of the Bureau, as Peters sufficiently shows, and it is the germ which Billings, up to 1889, asserted had no existence. If, therefore, confusion has been the result, the Bureau of Animal Industry is not responsible for it.

"If the name 'hog cholera' was not used in the place of

swine plague for the purpose of creating confusion," says Dr. Peters, "why was a septic pneumonia of the pig termed 'swine plague' unless for the purpose of causing further confusion? When, as we have seen, the disease is not confined to swine, but a little careless [careful?] study would have shown that the pigs could easily communicate it in other species of animals." As we have already explained, we called the American disease swine plague partly because an apparently identical disease in Germany, caused by an apparently identical germ, was known the world over as swine plague. That disease in Germany was described by competent men, and was accepted by practically the whole scientific world as properly described and named. If our disease is a septic pneumonia, the German swine plague is a septic pneumonia; if our disease is communicable to other species of animals, the same has been recognized as true of the German swine plague. And yet no scientist has attacked Loeffler or Schutz as being guilty of any impropriety in calling their disease swine plague. It has been reserved for Dr. Peters to make the discovery that it is a gross error to name a septic disease of pigs communicable to other animals swine plague; but why does he confine his remarks to the Bureau of Animal Industry, when we were following the example of the distinguished European scientists to whom reference has just been made?

Dr. Peters says: "I think that Jeffries' work is particularly accurate and very valuable, and am surprised that it has not attracted a great deal of attention, although it does not appear to have done so." I am ready to agree that Jeffries' paper was a valuable and timely contribution to the literature of swine diseases, but how does it happen that Dr. Peters, while so mercilessly criticising the work of the Bureau and praising the work of Dr. Billings, fails to point out that Jeffries absolutely disproves Billings' assertions that (1) the germ of the American hog cholera is identical with that of the German swine plague; that (2) the germ of hog cholera described by us in 1885 does not exist; that (3) there is only one communicable disease of swine in the United States, and that (4) a disease identical with the German swine plague does not

exist here? In his position on each of these important questions, Jeffries fully confirms the work of this Bureau, yet Peters has not a word to say to that effect!

To show the superiority of the work of investigators outside of the Bureau, Dr. Peters says: "Dr. Billings boldly announces that he found his germ of swine plague in July, 1886, among the first pigs that he examined in Nebraska which had died of the disease." It should be remembered in this connection that Dr. Billings had the advantage of our report in which we had described the germ of hog cholera, how to obtain and cultivate it, and its effects when inoculated in the smaller animals. All he had to do was to follow the methods we described in order to obtain the germ from the first hog he examined which was affected with the disease. But Billings has boldly announced a great many discoveries that have not fulfilled the expectations of himself or his friends. If he really discovered in July, 1886, the germ which he now produces as the cause of his swine plague, how does it happen that for two years afterwards he claimed that that germ had no existence? How does it happen that he asserted so positively the morphological and biological identity of the germ he then had with the *schweine-seuche* germ of Germany? How does it happen that the first germs he sent abroad were not the same as our hog cholera germ or his present swine plague germ (Dr. E. Bunzl-Federn, Archiv. f. Hygiene, XII., 1891, p. 198)? If these questions were satisfactorily answered we would be more disposed to admit the plausibility of Dr. Billings' bold announcement.

With the personalities and misrepresentations out of the way the only statements I find remaining in Dr. Peters' paper in the nature of a serious criticism are contained in the following sentences: "The so-called swine plague of the Bureau of Animal Industry is one of those septic diseases due to filth, and is seen chiefly where putrefying city swill is fed; and farmers around Boston find that if the swill is boiled and then fed, before there is time for putrefactive process to commence again, they are not troubled with it. In this respect it resembles closely the German *schweine-seuche*. If this be a true swine plague, make the most of it."

The objection to Dr. Peters' view, as stated here, is that it is too sweeping and dogmatic. His experience, however, has been limited to a few outbreaks among hogs in the vicinity of Boston, which were chiefly fed on swill. From this limited experience with hogs kept under one set of conditions, he wishes to generalize his conclusions and make them apply to hogs in all parts of the United States, and fed upon all sorts of food. And he is so intolerant towards the investigators of the Bureau that because their observations do not agree entirely with the conclusions which he has reached, he brands them as dishonest and unworthy of credence. In doing this he departs from the methods and traditions of true scientists, and injures his own reputation more than he does the reputations of those whom he attacks. Whether the disease which we have called swine plague is a true plague or not depends upon the extent of territory over which it occurs, and the amount of losses from it. This disease has so far been found in Massachusetts, New Jersey, Maryland, District of Columbia, Kentucky, Illinois and Iowa, as well as in Germany, so there is a certainty of its being widely distributed. The exact losses from it are, of course, unknown, but we have been satisfied from our investigations that they are sufficiently large to fully justify the name applied to it. Much more evidence has been accumulated to show its destructiveness here than exists in regard to it in Germany, and as has already been stated, the propriety of the name has not been questioned there.

A public official should not be unduly sensitive to criticism, nor object to it when it is reasonable and fair. But Dr. Peters has gone beyond this, attacking the honor and credibility of every scientist connected with the Bureau; his paper, going to those ignorant of the facts, is calculated to bring reproach upon our Department of Agriculture, our scientists, our institutions, and our country. The natural consequence of such documents is to retard the progress of science, to make farmers suspicious that the funds appropriated for investigations in their behalf have not been judiciously expended, and to make it more difficult to obtain appropriations for

such purposes. The Bureau of Animal Industry has employed more veterinarians, and has done more for the veterinary profession than any other institution or department of the government, and yet this man, representing for the time the profession, seized his opportunity to do what he could to cripple this Bureau. And when we examine his case, as we have just done in the light of recorded evidence, we find his argument can be characterized by the single word—misrepresentation. Condemning personalities, political methods and lack of honesty in others, he, in the same paper, makes himself liable to all of these charges.

In concluding, the writer calls upon the members of the United States Veterinary Medical Association to give this matter special consideration, to compare the quotations which he has made with the original documents, and to decide whether their body is to be made the medium for circulating such statements as are contained in this committee's report, or whether it will insist on carrying out the objects for which it was established, viz.: The promotion of harmony and good fellowship, the advancement of the profession, and the encouragement of honest and conscientious scientific research.

STERILITY OF MARES.

By M. E. Knowles, V.S., Terre Haute, Indiana.

Sterility of the mare and cow has attracted the attention of breeders in particular, and veterinarians in a mild sort of way, for years.

There have been many instruments invented and proposed for the cure of sterility, without a single suggestion as to the probable cause, other than ridged cervix—"contracted os."

I will not offer suggestions as to the merits of the different impregnators and nostrums offered to the breeder for the positive cure of sterility, but leave this for your individual opinion.

To my knowledge, no veterinarian has described any of the most frequent causes of temporary sterility, and it is with much hesitation that I now attempt it.

I assume that all are acquainted with the anatomical relations and physiological process of procreation, and will go directly to one of the most frequent causes of temporary sterility.

There is a popular idea that the semen is ejaculated directly through the cervical canal into the uterus, and without this conception cannot occur.

This is a physiological impossibility, and if it ever occurs is purely by accident and due to an extremely flaccid cervix with a uterus ballooned with air.

To disprove this popular theory, during the breeding season of 1887, through the kindness of Mr. M———, I conducted a series of experiments on seven brood mares in the following manner: A few moments before copulation in each mare the vaginal speculum was introduced, cervix secured with a vulcellum forceps and a rubber band then tightly drawn about the body of the cervix; a stallion served the mares in from ten to fifteen minutes after the application of rubber band; ten minutes later the band was removed by introduction of the hand, and in five of the seven cases, conception followed the first service, one was served twice and one three times before conception occurred, but at each service the elastic band was tightly applied.

Perhaps a more interesting and convincing proof of the absurdity of the intra-uterine-semen-injection hypothesis may be seen in the following: In June of 1888 a mare aged four years, thirteen and a half hands, was presented to a large standard bred stallion for service. The horse after two ineffectual attempts to complete the sexual act, refused to again mount the mare, although the penis entered about half way each time. I was called a few hours later to see her on account of apparent colic, with which she had suffered since the attempted copulation. On introducing the vaginal speculum the cervix was found intensly hyperæmic, evidently from contusion with glans penis. On measurement, the vagina was only eleven inches in length from labinum majora. This shortness of the vagina readily accounted for the inability of the horse to complete sexual congress and the cervical hyperæmia.

This mare being of some value on account of "blood lines," the owner was anxious to have her in foal, and to accomplish that end I suggested that the horse be permitted to serve another mare during the following œstrum of his mare and that I be allowed to transfer the semen by mechanical means to the mare in question: during the following month this was accomplished, the mare conceived and completed a successful gestation.

In this instance the semen was transferred with a curette, the temperature being maintained through the medium of hot water.

From the above mentioned and other experiments, I am led to the following conclusions: First, in a perfect physiological condition of the mare, the zoosperms reach the cavity of the uterus by their own movement; Second, the least pathological condition may, and often does, obstruct the movement of the zoosperms, thereby preventing their entrance into the uterus; and further, that certain secretions, the products of pathological conditions, destroy the vitality of zoosperms, thereby preventing their passage through the vagina and cervical canal, and should they reach the uterus they there encounter pathogenic secretions that destroy them.

Sub-acute and chronic cervical hyperæmia are probably the most frequent and fruitful causes of temporary sterility, due in an astonishing large number of instances to continually recurring abortions. By recurring abortions, I mean that the abortion occurs regularly after each conception within from twenty-one to sixty days, and this fact is common to both mares and cows, but on account of the very small fœtus, escapes the notice of the attendant, even if it passes onto a clean floor, which is rarely the case.

Suspecting the above facts several years ago 1886 I commenced to obtain information relative thereto, by making careful enquiry of all intelligent breeders of my acquaintance; I soon found, however, that not one of them even suspected such an event.

Mr. McK———, a very intelligent breeder of cattle, had at this time two cows that were continually being bred at an

interval of about two months, which he very kindly offered me for observation. He gave the date of the last service of each, and ten days from these dates I commenced daily making two examinations by speculum of each cow. On the morning of the twenty-ninth day from date of service in number one, I found in her vagina a twenty-nine-day-old fœtus. In cow number two, on the morning of the forty-third day, the attendant by "some peculiar circumstance" found a forty-three-day-old fœtus behind her, which he presented to me on my arrival at the farm. During this and the following year it was my fortune to make the same observations on twelve brood mares from different farms, with the result of positively finding the infinitesimal fœtus in the vagina of nine of the twelve, from twenty-one to sixty-seven days old.

In the remaining three the fœtus escaped me, but the condition of the cervix and intra uterine necrosa pointed plainly to the fact of abortion having occurred.

I will not venture an opinion as to the probable cause of the primary abortion, lest it should be due to complete or patchy hyperæmia of the emdometrium or cervix—the conditions most frequently found existing subsequent to the abortion, and in mares not known to have aborted.

The condition of acute cervical hyperæmia will be easily recognized on introducing the vaginal speculum; the cervix and frequently the adjacent vaginal mucous membrane will be engorged, vessels distended and the cervical folds thicker than in health, glued together by a thick mucous or muco-purulent discharge, which is rather scant.

The thickening of cervical folds at this time is evidently due to blood infiltration, but should the hyperæmia continue for some days the cervical connective tissue becomes infiltrated with serum, the folds œdematous, in which condition it remains for some days longer, when the exudation may become plastic; there sometimes seems to be a local lymphangitis, and occasionally, when this occurs, from the interference in circulation, or possibly blocking of lymph vessels, there is occurring local circumscribed necrosis of cervical mucous membrane, leaving an ulcer or ulcers that heal tardily.

The subject of vaginal and cervical ulcer will be considered in a later paper, when I shall attempt to consider cervical hyperæmia in a more extended manner.

Cervical hyperæmia is usually only a temporary cause of sterility, and is from change of surroundings and climate; but more frequently from keeping the mare away from the stallion during three or four rutting periods, relieved, and on subsequent service the mare conceives, and should there be no pathological condition remaining, accomplishes a successful gestation.

This desired event can, however, be by the veterinarian's assistance hastened in many instances. The treatment must be governed by indications alone. Hot or cold vaginal irrigations, with the addition of from five to fifteen per cent. boracic acid; tamponing cervix with heated boracic acid, &c.

When there is intense hyperæmia, I have found tamponing the cervix with a large pad of absorbent cotton, shaped to fit the cul-de-sac and completely enveloping the cervix, to be of material benefit, promptly relieving the hyperæmia by depletion. This tampon should have a string attached by which the attendant may remove it in from five to eight hours after insertion.

Where it is necessary to adopt this method, I follow the tampon for several days with a warm boracic acid water vaginal injection, employing usually from two to four gallons of water at a temperature of about 100° F.

In chronic hyperæmia, accompanied by cellular changes, and an organized exudate, painting the cervix once or twice weekly with comp. tr. iodine, followed with daily hot vaginal irrigations, has in my hands been productive of much good.

There is much in an examination properly made, and perhaps it may not be untimely for me to call your attention to the accompanying cuts of some gynæcological instruments, necessary for all veterinarians in breeding districts, that are desirous of seeing "per vagina" what there is in this direction. The instruments shown are necessary for the successful practice of gynæcology. These instruments are very nicely and lightly made by Haussmann & McComb of Chica-

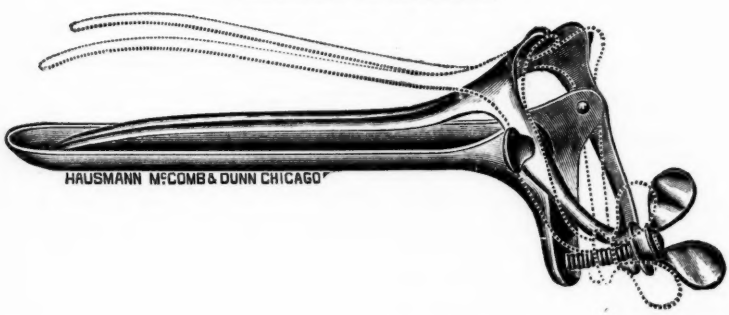
CURETTE.

VULCELLUM FORCEPS.

APPLICATOR FORCEPS.

APPLICATOR.

VAGINAL SPECULUM.



CERVICAL SPECULUM.

go, who have by my direction succeeded in getting all, but most especially the vaginal speculum, so light and convenient that its introduction and retention is borne without inconvenience by the most nervous of mares.

The cervical speculum is used for intra-uterine examinations and should be introduced before the vaginal.

The method of introducing the cervical speculum is as follows: the hand and arm well oiled is introduced and the cervix dilated, then thoroughly oil the speculum, introduce, and, by depressing the handles open the valves to a convenient width; now introduce the vaginal speculum, having the mare in a convenient sunlight and the wide, brightly polished single valve will reflect ample light into the uterus for ordinary examinations; should, however, a more minute examination be required, resort must be had to a small electric light of three or four candle power, (power furnished by a portable storage battery), which can be carried into the uterus with the applicator or applicator forceps.

For the purpose of faciliating the reflection of sunlight into the uterus it will be necessary to manipulate the cervical with the end of the vaginal speculum to the desired angle; this can, however, be more satisfactorily accomplished by securing the cervical speculum in the vulcellum forceps, thereby allowing perfect liberty of the vaginal speculum, consequently better light reflection.

As time may permit, I will acquaint you with some other causes of sterility, some of them very rare and interesting, and report some cases treated during the last year.

TETANUS.

By G. Z. Barnes, D.V.M., Pekin, Ills.

(A Paper read before the Illinois Veterinary Medical Association.)

Tetanus may be defined as an extra-organismal infectious disease, characterized by a spasmodic contraction of the voluntary muscles, with tension and rigidity of the parts affected.

According to Williams, "as a generic term it comprehends

all the varieties, but when not used in this sense, it implies that the disease involves all classes of muscles equally. When the muscles of mastication are alone involved, it is called *trismus;* when it chiefly affects the superior cervical and dorsal muscles, causing the head to be elevated and the spine curved downwards, it is called *opisthotonos;* when the muscles of one side are affected it is called *tetanus lateralis.*"

I believe, for all practical and scientific purposes, tetanus should be classed into two varieties: acute, and sub-acute, or chronic.

Acute tetanus is in my experience always due to some traumatic injury, though it might occur from idiopathic causes.

The symptoms of the acute form are always well defined. There is usually a difficulty in chewing and swallowing, stiffness of the neck and limbs, tail elevated, protrusion over the inner part of the eye of the membrana nictitans, manifested on the least disturbance, and marked nervous excitability. Temperature and pulse not much affected at the beginning of the attack, but in the acute form as the disease progresses a marked increase in temperature is noted, and the pulse becomes quick and hard when the spasm affects the muscles of the heart, or rapid and feeble when it relaxes. All the symptoms in the acute form become rapidly aggravated until the jaws are completely locked, all the muscles are rigid in a state of tonic spasm, a cold perspiration breaks out on the body, and if the animal be suddenly disturbed the superficial muscles will be seen to twitch and tremble. Death usually takes place in from one to five days, either by complication of the pulmonary structures, asphyxia; from exhaustion, as a result of protracted and severe muscular rigidity and frequency of convulsive attacks; or from hyperpyrexia, associated with an elevation of temperature to such a degree that the organic functions of the heart and lungs are impaired and finally cease.

The sub-acute or chronic form differs from the acute in that the symptoms of the attack are more insidious and less marked, although nearly all are observed; in some, however,

the jaws do not lock. Usually they do about the ninth day, remaining so from two to ten days, after which they gradually regain their normal function. All the symptoms may gradually increase in severity for a period of ten days, and then gradually diminish under judicious treatment, or they may reach that stage when all the symptoms of acute tetanus become developed, and death take place the same as in the acute form.

Ætiologically the disease is now generally considered to be due to a specific micro-organism, a pin or brush-shaped bacillus which bears the name of "the germ of Nicolaier," discovered by him in 1884. Doubt may still exist as to whether one single germ is invariably the actual cause of tetanus, and the exact nature of the disease cannot yet be considered as positively known; yet its infectious character is now conclusively settled. The results accomplished in the last few years have established beyond reasonable contradiction, not only the fact that the disease may be produced by inoculation into animals of pure cultures of the germ of tetanus, but that tetanus is clearly a microbic disease, with the germ of Nicolaier as its essential or primary cause.

To Kitasato, a Japanese student in Dr. Koch's laboratory, great credit is due, since he not only first isolated the germ, and with pure cultures produced the disease in animals, but also established the identity of the soil bacillus and that obtained from the wound of a horse suffering with the disease.

One of the most interesting articles on tetanus is that of Dr. Theo. Kitt, of Munich. In one of his experiments a portion of the dried pus obtained from an abscess in the hoof of a horse which had died of tetanus, was ten times diluted with sterilized water, and two cubic centimetres (32½ minims) injected subcutaneously into the neck of a horse. From September 21st to October 9th the horse remained apparently well, then symptoms of tetanus came on, the animal grew rapidly worse and died at midnight, October 10th. "The symptoms were those of tetanus in horses, notably the peculiar facial expression and the dilation of the nostrils."

As the horse was old and worn-out, and the disease ran

such an acute course, it was thought necessary to have more proof that the horse had succumbed to inoculation tetanus and nothing else.

Autopsy made October 7th. No special organic lesions were found, but from the area of the diffused redness under the point of inoculation some liquid was collected with an aseptic instrument, and nine white mice were each inoculated in the subcutaneous tissue of the hip, with an amount of material varying from one-eighth to one quarter of a grain. All had tetanus by the 14th, and all died. Kitt concludes in his paper that tetanus in the horse is caused by a bacillus, identical with and resembling that of human and soil tetanus.

Another interesting contribution to the subject of tetanus is that of Dr. Bassano, whose elaborate work in the examination of various soils for the presence of Nicolaier's germ has attracted considerable attention. He secured soil from forty-three different countries from many parts of the world. The earth of twenty-seven countries gave positive results.

The observations of Dr. Sormani on the action of gastric and intestinal secretions on the bacillus of tetanus deserve mention. He caused herbivorous and carnivorous animals to swallow pure cultures of the bacillus. His conclusions are, First, the flesh of animals that have died of tetanus can be eaten with impunity. Second, the microbe of tetanus can pass through the alimentary canal of herbivorous and carnivorous animals without causing any symptoms. Third, the digestive secretions of these animals neither kill nor alter in any way the bacillis of tetanus. Fourth, an animal can introduce into its stomach, with impunity, a dose of tetanic virus two thousand times greater than that which is sufficient to kill if injected subcutaneously.

Koch's laboratory has been giving tetanus a liberal share of its attention. From one of their reports it appears that Drs. Behring and Ketasito have made positive advances toward the production of immunity against tetanus. These two observers have been engaged for some time in a study of the nature of diphtheria and tetanus, and they have at last succeeded in not only conferring immunity in animals against

attacks of either disease, but also in arresting it after it has already set in. This surely is suggestive and encouraging. Though the nature of the material used by Behring and Ketasito has not yet been published, it is strongly probable that it is of animal origin, and perhaps bears relationship to the already far famed anti-tubercular lymph given to the world from the same laboratory. From the various articles we were able to get on this subject, we believe we are safe in arriving at the following conclusions:

First, tetanus is a specific infectious disease. Second, outside of the diseased organism the specific germ may develop in the soil. Third, in addition it may exist at different points, on the coats of horses or other animals, in the dust of hay, surgeons' instruments, etc. Fourth, these different situations (soil, dust, horse, etc.) constitute a closed cycle, from any element of which the bacillus may constantly or indefinitely emigrate, so that it is not possible to designate the point of initial departure. Fifth, the horse plays in this transmission no greater role than cattle in the propagation of tuberculosis.

As to the treatment of tetanus we have nothing particularly new to offer. Unfortunately the disease is well under way before a veterinarian is called. In acute tetanus from traumatic injury, local treatment, to be of any service, must be soon after the injury has been inflicted, before the symptoms have become marked. Poultices and fomentation should be applied to the injured part. I can see no benefit to be derived from such heroic treatment as ripping open a cicatrix, burning a hole into a horse's foot, etc., etc., but believe we should aim to relieve irritation that has induced the tetanic condition so far as possible, and support the patient's strength so as to enable him to hold up against the disease.

Nothing has been more unsatisfactory to me than the treatment of the acute form of traumatic tetanus. I have yet to learn the drug or combination of drugs that has any merit as a curative agent. Many serve as palliatives, and afford some temporary relief to the patient, and much may be done by the surgeon by removing all sources of external irritation to mitigate his sufferings. In the acute form, I have not found

slinging a more favorable condition for him to withstand the torture or lessen the spasms than out of it. A cathartic of aloes is recommended by all veterinary writers, but I can't say that I believe it to be of any particular merit, because while it clears the bowels, it is to a certain extent a depletive. I am of the opinion that when the progress of the disease reaches that state where spasm of the involuntary muscles is observed, that the case is hopeless. Neither do I believe anything is accomplished by the attempted introduction of food per rectum.

Nearly all the drugs of the pharmacopœia have been advocated and tried for tetanus, but I am of the opinion that in the sub-acute or chronic form (the only form admitting of treatment) more may be accomplished by simple than specific treatment. Although I generally prescribe gelseninum and cannabis indica, alternating with large doses of Fowler's solution of arsenic, I am firmly of the belief that simple treatment is the much more rational method to employ, rather than the vain hope of finding a specific, to be constantly recurring to antispasmodics and sedatives, which repeated experience has proven to be useless as curative agents.

Experiments have been made and nitrate of silver has been found to be a powerful agent in the destruction of the bacillus of tetanus, hence its therapeutic value in treating wounds where there is a possibility of tetanus following. Dr. Sarmani recommends iodoform as a wound dressing in this disease, claiming that it neutralizes perfectly the poison of tetanus.

FOUR CASES FROM A NOTE-BOOK.

By J. F. Winchester, D.V.S., Lawrence, Mass.

(Paper read before the Massachusetts Veterinary Association, Oct. 28th, 1891).

PERITONITIS AND DEATH AS A RESULT OF RUPTURE OF THE EXTERNAL COAT OF THE STOMACH.

History.—Animal sick all night with colic. Called to see the horse in morning; found animal down, pulseless, cold

sweat, and diagnosed peritonitis, with the prognosis of death within a short time.

Post-mortem twenty-four hours after death. Black roan gelding. Tympanitis well marked. Removed the abdominal muscles, found peritoneum dark in color, blood vessels well dilated, and a large amount of straw-colored serum in abdominal cavity. The large and small colon were normal in color with the exception of a slight light red blush, which was also found on the small intestines.

The stomach was distended, and had a rupture of the external coat along the large curvature for nearly two feet. The muscular fibers of the middle coat were separated and well defined. The rest of viscera normal.

RABIES.

About July 10th, 1890, a bull terrier, owned in Boston, was bitten by a dog that was running amuck through the highway. The bite was not a severe one, and no special notice was taken of it; but the owner asked me within a few days what was the chance of his dog becoming rabid.

The result of the opinion I expressed was that the animal was placed under close confinement for a period of about three months, when, as he remained in an apparently normal condition, the restrictions were removed.

Nothing was observed abnormal until the middle of May, 1891, when on the 17th he was excitable and irritable, and bit a dog that had been his companion for some time. The wound was made over the eye, and had the appearance of being made with one tooth. As a result of that he was again chained in the hay-loft, and then began a series of symptoms that would cease only from exhaustion, or the presence of the groom—barking, tearing anything within reach, breaking windows and sash, and he at one time broke his chain. When approached by the groom he would stop and crouch, with only quick breathing to be noticed. This condition lasted three days, and he was found dead one morning.

POST-MORTEM.—Rigor mortis well marked. The abdomical viscera normal with the exception of the contents of the

stomach, which consisted of foreign matter. The organs in thoracic cavity normal. The blood vessels under the pia mater in the convolutions of the brain were congested, and also the plexi in the three ventricles.

The dog that was bitten May 17th died June 12th, having been sick a few days, and the owner told me he had the same actions as the dog that bit him. Prescribed during his sickness.

PERITONITIS AND ABNORMAL SPLEEN.

October 1st, castrated chestnut colt seventeen months old. The manipulation easy and soon over. Colt got up all right, no bleeding, put in box-stall, tied up, given hay to eat.

October 3d. Visited the colt. He was bright, active, good appetite, full of life, and it required some tact to open the scrotum, which was done, and the usual amount of serum was found.

October 12th. Was called and found colt dead at noon.

HISTORY.—Saturday, the 10th, he was apparently all right, eating well and in good spirits, not any unusual degree of swelling of scrotum, the openings discharging well. Sunday, the 11th, did not feel well, but ate until evening. No marked pain, but his head was down and dull. Monday, the 12th, up and down during the morning, but no pawing or acute pain, and at noon he died without a struggle.

POST-MORTEM.—Chestnut gelding, seventeen months old. Not bloated, body warm, well marked rigor mortis, scrotum some swollen, holes open and discharging apparently normal pus. Removing abdominal muscles, found the peritoneum inflamed, and opening the same, serum poured out copiously. The small colon was blushed light red in color, the same with the large colon. The small intestines were very red, of deep carmine color, and peritoneum dark red, and the blood vessels in the peritoneum were filled and well defined.

On the right side and under the stomach found an organ shaped like the spleen, weighing about three pounds, dark blue in color, spongy texture; the capsule on side next stomach ruptured and covered with coagulated fibrin.

On left side and underneath, (on top as animal was on its back), found a spleen weighing about two pounds, normal in shape, color and texture. The rest of viscera apparently normal.

FISTULA OF STENO'S DUCT.

Last spring the owner of the horse in question noticed that the animal did not take the bit as kindly as had been his habit, and acted as if his mouth was sore. Within a short time the horse was brought to me, and an examination of the buccal cavity disclosed that the third upper molar was diseased, and the outside edges were very pointed; this condition was remedied, and the animal returned to work with apparent relief.

Two or three weeks after this the owner noticed an enlargement on the left side under the jaw bone, which gradually increased in size until it broke, and a continual stream of clear, thin fluid escaped. This condition the owner tried in vain to control for about three weeks, and then the animal was again brought to my notice. At once recognizing the trouble, I began to look for the cause, and examining the mouth, found that the mucous membrane on the left side of the mouth opposite the third upper molar was corrugated and inflamed. Thinking that the cause of the trouble might originate there, I tried to pass a catheter while the animal was standing, but failed to accomplish the feat. Sent the horse home, and had him prepared for casting, and the next day he was cast, and the catheter was passed into the duct down as far as where it runs under the bone, and then the animal was allowed to get up.

The opening under the jaw was kept clean, and a strong solution of carbolic acid applied to the part several times a day. The result of this was that the discharge stopped after a short time, and, at time of writing the animal is apparently all right, with the exception that the course of the duct is well defined back to the gland.

A CASE OF SPRINGHALT.

By W. Bryden, V.S., Boston, Mass.

(A Paper read before the Massachusetts Veterinary Association, Nov. 25, 1891.)

About the 1st of June, 1891, I received a letter from Dr. Howard, President of the Massachusetts Veterinary Association, inviting me with other veterinarians to call at the wharf of the N. Ward Company, and see a remarkable case of springhalt. It was intended to kill the subject within a few days, and send the spinal cord to Worcester to be examined at the Clark University there. The invitation was accepted, and the case carefully examined.

He was a small, black pony, about fourteen hands high and twenty years old, apparently well enough with the exception of his hind legs, which were badly affected with springhalt, both legs being nearly, if not quite, alike. In viewing him from behind, the crests of the illium were about even, the gluteals both alike flat, the hips drooping, and the sacrum and tail elevated and coarse; the muscles superior to the stifle were somewhat wasted, and muscles behind the tibia were small and felt like tendons to within two or three inches of their origin; the hocks were both coarse, but not more than ought to be expected under the circumstances, his age and the way he had been used for a long time, having tended to produce changes; both had a small elevation, or slight coarseness, at the seat of bone spavin. The legs afterwards became swollen below the hock, from the fact that the stall in which he stood part of the time, although at least five feet wide, was not wide enough to enable him to walk into it, and when once in if he attempted to move, which was very frequently, he struck the outside of his ankles with such force against the sides of the stall that they became swollen, bruised and sore.

The parts that attracted my attention most, however, were his hoofs. They had evidently been causing the creature trouble for a long time, and were both alike, or nearly so. They were smaller than nature intended them to be, and

nearly round, the wall short, the sole low, the bars strong, the heels short, and the frog of medium size. The horn seemed fairly healthy, but it grasped the extremity like a vise, causing him such uneasiness that often during the night he would dance about for several minutes at a time, making it difficult to enter the stall or go near him. Indeed, his attempts at locomotion were ludicrous, and he threw himself down several times and yelled either from pain, fright, or irritation, due probably to some form of neuritis or neurosis.

I wrote to Dr. Howard, through Dr. Austin Peters, the Secretary of the Massachusetts Veterinary Association, stating that I had seen the animal, and that having treated such cases, though never one so bad, I could demonstrate that the primary trouble was not in the spinal cord, which had very little seriously wrong with it, but in the feet. I also offered to take one leg, any one else who had a theory of his own or others on the subject taking the other. Nobody wanted it, however, so the case was kindly turned over to me, and on June 9th, 1891, I commenced treatment as follows:

A horseshoer, with a sharp knife and rasp, was secured. The foot when lifted was held with great difficulty. The wall was thinned with the rasp all it would bear as high as the coronet. The sole was next leveled; the inside wall, both from the fact that he toed out and his stamping his foot with great violence on the inner half, was low. The soles were carefully trimmed; the commissures pared out; the bars thinned, and the heels opened. This greatly relieved the crowded structures within, and removed the mechanical pressure and interference with the blood vessels and nerves of the extremity. He was then left in charge of Mr. Andrew Ward, who took great interest in the case, furnishing keep and faithful attendants who had orders to keep his feet continually in poultices. For two or three days he tolerated this treatment, and improved at least fifty per cent.; but from his own efforts to get the poultices off, or from the bags being tied too tight, his pasterns became badly corded and so sore that he became almost unmanageable. Nothing further could be accomplished until these sores were healed. This was followed by a slight

blister of bin iodide of mercury ointment, applied above the coronet, which took three weeks to heal, during which time he was worse, if possible, than at the beginning. The blister was a mistake.

I then had him stand in mud during the day, and at night ordered his feet to be wrapped in long bandages soaked in lime water, linseed oil and soft potash soap, to which was added a little carbolic acid. These were neatly put on the hoofs in figure eight fashion, and kept soaked with the preparation. He tolerated this treatment and began to improve very rapidly, and on the day he was destroyed, July 27th, from two to three weeks after I had stopped treatment, he was able to trot off after two or three twitches, on starting a quite natural gait, both on a straight course and in turning, something he was unable to do before being treated.

So far as I am aware, this discovery was made by my father over thirty years ago in Northern Vermont, where our family settled on arriving in this country from Scotland, and where we remained for six years before removing to Boston in 1861. He was led to it by observing the large number of colts every spring with defective hoofs and legs, which he attributed mainly to the restraints and idleness incident to domestication and the want of tear and wear to the hoofs during the long winter months, especially while the animals were growing. Many have treated the hoofs for defects and diseases of the feet, but no one before had ever grasped the grand conception that they dominated and determined the character of the limbs, and influenced the conformation of the body, too. On my graduation from the Montreal Veterinary College in 1871, I took up at his request the study of the subject and submitted to *The Veterinarian* at least two short articles on springhalt and other diseases peculiar to horses' limbs, and which I maintained were caused by defective conditions of their hoofs; the first in 1873, I think, the second in July, 1875. Since then I have contributed to about all of the veterinary journals published in Great Britain and America articles relating to animal locomotion and veterinary orthopedics, among which springhalt was always included.

There are several modifications of springhalt. This case presented features somewhat similar to what are sometimes seen in connection with bad forms of scratches, although when I first saw him and up to the time when the poultice strings hurt him, and he was placed in the narrow stall, there was no abrasion or evidence of soreness or inflammation of the skin. In other respects it showed all the symptoms of ordinary chronic springhalt.

In previous articles on this subject I have pointed out that the successful treatment of this disease depends on whether it first presents itself in a very young animal, or in one that has reached maturity. The young animal, affected with it from early youth, if allowed to grow up without any effort to arrest or control the defect, will be found the most difficult to treat successfully after maturity, as inharmonies in the different parts of the leg are not easily regulated; whereas springhalt occurring at maturity or after, if not the result of a permanent injury, is very often quite as amenable to treatment as other erratic or equivocal gaits, such as paddling, interfering, over-reaching, hitching, pacing, etc., defects attributable to a similar class of circumstances and surroundings, and composing a family of diseases that have no relationship whatever to chorea, or other diseases originating in the brain or spinal cord.

Whatever part the hoof crowds in or interferes with will react on some part of the limb above, causing changes, it may be in one or more muscles or parts, so that they act out in harmony. It may disturb a nerve and destroy or modify its influence, changing the gait, or causing lameness. It may cause shortening of such parts as the flexor tendons and ligaments, and the animal walks on his toe, or on the side of the foot. It may induce shortening of the metatarsal flexor and cause it to do more than its share of work, when bone spavin will follow. It may cause shortening and atrophy of the muscle of the hip, and the tail will almost invariably be carried to the shrunken side, instead of the side on which the muscles are strongest. All those diseases of the limbs recognized as peculiar to the horse have their origin there. There we find

the predisposing factor. The acquired defective hoof determines the character of the defect in the limb. Gen. Grant, in his letter to Dunbar, endorsed this significance of the influence exerted by the hoof.

A springhalt gait from any other cause is not springhalt. To class it with chorea, or to imagine it due to changes in the bones of the hock is nonsense. The changes in the hock and elsewhere are coincident; results, not causes.

Let members of the veterinary profession take up this great study of veterinary orthopedics, animal locomotion and organization—pedospedics, as Mr. Hubbell has named it—or by whatever name we finally decide to call the study, instead of all rushing into specialties in bacteriology, etc., and depend upon it a domain containing treasures of such richness and such interest will be found, that if known more perfectly now might have made the recent grand achievements of Sunol, Palo Alto, Allerton and Nelson several seconds faster. This is the science that is not only to save our phenomenal two-year-olds from decrepitude at five, but that is to make it possible for them to rival their early achievements when three times five.

Among our great horsemen a few have seemed to appreciate the importance of this glorious subject, more have tried to explain it, but none with the comprehensiveness to which it is entitled. The veterinary profession still has an opportunity to demonstrate the richness of some of the gems it contains. It ought to be one of the most important "chairs" in our veterinary educational institutions, and one that many among our influential people would delight in assisting to endow. Let us do original work here, and not look to France and Germany for everything new. Let us begin now, before some one has to teach us, and again carry off the honors.

THE GENERAL PATHOLOGY OF "SURRA" IN ANIMALS.

By R. W. Burke, F.R.C.V.S., Corresponding Member of the Italian Veterinary Academy, Army Veterinary Department, Amballa.

(Reprint from The Empress Press, Amballa.)

The contributions to the literature of *surra* in the pages of

our journals are at once instructive and suggestive. Coming from the pens of experts, from those who have had much personal acquaintance with the disease and those who have studied its natural history and pathology, they form a valuable collection of opinions which serve to illustrate the difficulties of inquiry and the obscurity that still dominates the subject. The need for investigation is clearly shown, but the complexity of the questions to be investigated is manifestly great. Many of the writers furnish lists of propositions regarding the classification of the parasite; some indeed limiting themselves to these, whilst others deal more generally with the subject. It could hardly be expected that anything like unanimity of view should prevail, and without attempting to cover the whole ground, it may be useful if we submit a few suggestions upon moot points regarding the disease. In the first place, there is considerable divergence upon the essential nature of surra. I. V. S. Evans was the first who noted the presence of parasites in this disease, but he did not identify the malady. Mr. Steel stands alone in the belief that it is "a form of relapsing fever in the horse." Most veterinary practitioners who have studied the disease, as well as acknowledged bacteriologists, show that there is nothing in common between the two affections. Indeed, Dr. Vandyke Carter himself cannot see any identity between the parasite of surra and the spirillum common to relapsing fever in man. Surgeon-Major Ranking contends that surra is, in fact, ague in the horse. Indeed he thinks that at present there is no other deduction from the facts, and thinks he has obtained further evidence in support of the opinion he has formed as to the identity of the plasmodium malariæ and the bacillus malariæ in man. He advances reasons for his belief that the general view of the plasmodium being considered as a protozoon is also incorrect. And he points out facts in support of his arguments that surra and ague are equivalent diseases. It is by no means necessary to the truth of his argument that such is the case, as he relied upon the diagnosis of veterinary surgeons that the disease he investigated was surra, and "the diagnosis was borne out by its fatality." Although we can-

not entirely subscribe to Dr. Ranking's opinion that its fatality allies it to ague, yet he has so well supported our own views with regard to the nature of surra* and has so thoroughly studied the question of the micro-organisms present in that disease and argued it with such ability as to compel attention to his views, and indeed the whole question of its parasitology in any inquiry that may be made. The observation of parasites in intermittent fever of the horse (*Equine Diseases of India*, by R. W. Burke, July, 1887, p. 4), resembling those described by Laveran in the blood of man during the ague paroxysms, receives confirmatory evidence also from the pen of Dr. Carter (*Lancet*, June 16, 1888) who found that in ninety-three instances of malarious disease in man (intermittent fever, simple remittent fever, and splenic cachexia) these organisms were present in nine. I have recently shown (*Veterinary Journal*, March, 1890), that similar organisms are present in intermittent and remittent fever of the horse.

Among the parasites found in the blood of the horse the most remarkable is the monad, which is known in India as the surra parasite, the disease with which the creature is associated being termed *surra*, or pernicious anæmia (*Tropical Diseases of the Horse*, 2nd Ed., by R. W. Burke, 1888). Much valuable proof of the influence of the surra parasite in the production of the disease has been lately advanced. It is quite certain, however, that the same parasite—or, at least, an identical organism so far as form is concerned—is found in the blood of a large proportion of the common sewer rats (Lewis, Crookshank, Carter) and camels (Evans), etc., apparently in perfect health. Very little doubt exists as to the occasional presence in the blood of wandering larval nematode worms. The fluid is not generally considered to be the home of parasites, and the helminthologist rarely thinks of searching for them in the interior of blood vessels.

Other animals, besides the horse, have been known to suffer from the disease. Megnin (*Ref. Thierartz*, 1882,) de-

* See article on Malarial Fever Among Horses in India, by R. W. Burke, in the *Veterinary Journal*, July, 1890.

scribes a symptomatic type of this disease seen in dogs and cats, which was caused by an ankylostome producing anæmia, and which is, without doubt, a similar disease to the symptomatic form of anæmia in man. Johne (*Sachs Jahresbericht*, 1884) saw this disease in the dog as a secondary affection following a suppurative form of disease. Imminger (*Wochenschrift f. Thierheilkunde u. Vichzucht*, 1886) has observed enzootic outbreaks of it in cattle. Frohner† (*Archiv. f. Wiss. u. Prakt. Thierheilkunde*, Bd. xii. 5 u. 6 Heft, 1886) describes having only recently seen this disease in the horse, and Friedberger (*Lehrbuch der spec. Pathol. u. Therapie der Hausthiere*, vol. ii, 1887) also saw an outbreak of it in this animal, in which similar parasites were found. We know how severely animals suffer from the presence in the blood of other minute organisms. The strongylus tetracanthus gives rise to epizootic outbreaks of emaciation in horses in many districts of England (Gresswell, *Manual of Equine Medicine*, 1885); the strongylus contortus has been known to produce a form of pernicious anæmia in the horse (*poikilocytose*) observed in Buenos Ayres (Wernicke, *Duets. Zeits. f. Thiermed. u. vergl. Pathologie*, 13 *Bd.*, 2 u. 3 Heft, 1887); Texas fever of cattle has been shown to be due to a paroxysmal destruction of red corpuscles, caused by an intra-globular parasite which Dr. Theobald Smith thinks may be a phase in the life history of some of the mycetozoa, such as the monadineæ, or it may belong to the group of sporozoa, some of which are pronounced cell parasites. (*Vet. Journ.*, March, 1890.) Whilst not only anæmia but liver disease and a form of dysentery are produced by allied parasites in man (Leukhart, Fayrer, Kynsey and others.)

One can hardly conceive that these organisms should exist in the blood, in any numbers, without affecting it prejudicially, though we know they have been found in the blood of animals which were apparently healthy. Of course, it is difficult to define any absolute standard of perfect health, and there may be a considerable amount of cachexia, even in ani-

† *Ueber perniciose Anamie beim Pferde, von* Eugen Fröhner, Berlin, 1886.

mals appearing quite healthy. Dr. Paquin has noted that the parasites of Texas fever are found in the normal liquids and tissues of infectious cattle that always appear healthy, and even in the young before birth. He says,—"The germ of Texas fever requires a resting period, during which it regains its vigor, and until such time as vigor is regained it lies dormant." (*Journ. Comp. Med. and Vet. Archives*, July, 1890.) What the peculiar change in locality or action on the part of the monads may be that determines the diseased condition, is one of the points which needs elucidation. We naturally ask if there be any analogy in the behavior of other parasites in this respect? Dracunculus may cause little or no trouble in the earlier stages, but developing, changing place, and discharging its embryoes, the gravest results follow; trichina in its earlier stages is comparatively unfelt, but may become the cause of fatal disease. We may therefore conclude from these facts that, in order to produce surra in animals, various conditions, such as affect the patient's system as well as influence the parasite in question, are essential; and that in the absence of these conditions, the same parasites may frequently be present in the blood without causing any disease. Similarly, in regard to the relation of anchylostoma to the anæmia of man, it has been noticed that this parasite was so frequent in the post-mortem examination of cases that did not die of anæmia, that it is doubtful as to whether its presence invariably gives rise to anæmia with all its train of symptoms.—(*Brit. Med. Journ.*, June 30th, 1888.)

Dr. Vandyke Carter,* of Bombay, has demonstrated that malarial fever in man is of the nature of hæmatozoic affections. He has ascertained that in remittent fever of man the blood contains parasites which, in their morphology and general features, are identical with parasites of surra in lower animals. Prof. Klebs, of Zurich, who has made a thorough examination of the blood of many patients suffering from influenza, has found in it enormous masses of flagellate monads.

* On the lately demonstrated Blood Contamination and Infective Disease of the Rat and Equines in India, 1888.

Note on some Aspects and Relations of the Blood Organisms in Ague, 1888.

These were of two forms: a smaller, with very active movements of the flagella, and a larger, with much slower movements. In specimens stained with methyl blue, Professor Klebs observed that the monads were sometimes on the edge of the red blood corpuscles, and sometimes inside them. They are said to resemble the hæmatozoa of pernicious anæmia, and the plasmodia found by Laveran in the blood of patients suffering frommalaria. (*Wiener Med. Zeitung*, Feb. 4th, 1890.)

I have in the first edition of my work on *Equine Diseases of India*, 1887, and elsewhere, shown that similar monads may be found in intermittent and remittent fever of the horse in India. And Dr. Ranking has recently claimed an identity between the organisms of surra and those found in intermittent fever (ague) of the human subject (*Veterinary Journal*, June, 1891). Klebs acknowledges that in those cases in which he observed flagellate protozoa in the blood in very large numbers there was a repeated occurrence of febrile states, generally in the form of intermissions (*Ceutralb. f. Bact. u. Parasit.*, No. 5, vii, 1890). The existence of protozoa in the blood in malarial or intermittent fever is undoubted, and Dr. Klebs assumes that in those cases in which he noted the presence of monads (*Rhizomastignia* of Butschli) there was a repeated occurrence of febrile states, generally in the form of intermission. (*Brit. Med. Journ.*, Feb. 15th, 1890).

The differences of opinion of various investigators as to the morphology of the parasite witnessed in surra are clearly accounted for in McCurdy's description of the organism peculiar to Texas fever, which I believe to be an analogous disease. Mr. McCurdy says, — "The germ of this disease may be said to be of the bacillar species and the facultative type, assuming various forms during life. The ovoid forms are the ones particularly noticed, but it appears that this is only a transition stage which finally terminates in the more mature form. If cultures are prepared from material containing the ovoid forms, they elongate, become surrounded by a gelatinous areola, and break off into two short rods or double and single bodies. The spherical ovoid forms and short rods are found both in the liver and fluids in zooglea. At the

ends of some germs flagella are noticed, which probably give them the slow, bending, twisting motion that is often seen in many cultures. The more mature forms vary in size from 4 m. to 5 m. in length, and 17 m. in width; in the ovoid stage, the length is from 25 m. to 30 m., and width about 15 m. They are difficult to stain, but answer most readily to 'Johne's fuchsin.' The cultivation has been tried in many different media, such as blood serum, beef broth, agar-agar, egg albumin, potatoes, and oyster bouilon, but artificial lymph with liver broth seems to be productive of the best results."—(*Vet. Journ.*, June, 1891).

Speaking of the intra-globular bodies met with in Texas fever of cattle, Dr. Theobald Smith* says,—"The smallest forms appear like deeply stained cocci, about $\frac{1}{2}$ to 1 μ in diameter, situated within the unstained circle of the corpuscle. Occasionally the bodies are nearer 2 μ in diameter, and then the staining may be less dense. Besides the spherical forms, ovoid forms are not uncommon. These usually occur in pairs within the same red corpuscle. A still rarer pear-shaped form is encountered in stained preparations of the blood. It is rounded at one pole, while the other is pointed and sometimes drawn out as a short filament. These forms quite invariably occurred in pairs, a corpuscle being occupied by a single pair. I believe the pair to be a result of division of the single body within the globule. In one instance I saw the tapering ends of a pair apparently continuous. Each body was about 3 μ long, its greatest width, 1-5 μ. These are the largest I have encountered." This same form of organism has been noted by Frohner † in pernicious anæmia among horses in Germany, where two, and even three or four were witnessed in the same corpuscle.

Of chief interest at present stands the subject of the pathology of surra. The discovery of the parasite might be thought to have advanced the question of its etiology sufficiently in itself without any further questions regarding

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* *Veterinary Journal*, March, 1890.

† *Archiv, f. Wiss. u. Prakt. Thierheilk.*, Bd. xii, 5 *u.* 6 Heft, 1886.

the disease, but as we have endeavored to show, there is much to learn about this parasite and its behavior in the body of the animal. Our means of investigation are generally so limited and imperfect that in any inquiry we must note everything that might lead us to form anything like an accurate notion of the facts presented. Much valuable data has been advanced by the different writers in support of their beliefs; still, all is hypothetical, and the need for extended inquiry into the pathology of surra was never better shown. In fact, we are not far from the truth in asserting that a wider knowledge of the laws of pathology may be requisite before the problem can be properly approached.

After all, the main problem is, what disease in mankind is surra allied to in its main points? Has it any identity to any disease of human beings? To what disease does it bear the greatest resemblance? And in what points? So far the answers to these questions have not been faced properly; for although the answer to them would greatly assist our inquiry into the pathology of the disease, yet hitherto it has been found impracticable.

The general name of ague, intermittent fever, or malaria is given to a disease produced by a common cause;* and the same cause is credited with producing other more severe forms of disease called remittent fever, pernicious anæmia, malarial cachexia, etc. It may be a question whether all these forms of fever are due to the same cause; but the general opinion is that they all constitute the same disease in various degrees of severity. The one feature common to all is fever which remits and returns periodically. The other symptoms need not be considered here. It will suffice, perhaps, if we take up the characters of surra first. We shall then be able to arrive at an opinion as to which condition it is allied to in

* With regard to the nature of the germ, certain researches seem to identify it with a certain bacillus found in the soil of malarious districts; but more recently an animal organism, a flagellate infusorian, has been found in the blood of ague patients, which seems more probably the cause of the disease. It has been shown by Marchiafava and Celli that the inoculation of the blood of an ague patient into healthy persons will reproduce the disease in them.

particular. We have alluded to these points in previous articles we have contributed to the *Veterinary Journal* and elsewhere. In drawing attention afresh to this disease I shall refer briefly to the most important features which are regarded as peculiar to it.

We may state that the clinical history of surra in general is that of penicious anæmia. The marked anæmic conditions, observed both *ante* and *post-mortem*, leucocytosis, fatty degeneration of the muscles, liver, spleen, and other organs, the general hemorrhages, and the chronic state of fever, which end in death in so many cases, leave no doubt as to the nature of the disease.

(*a*) TEMPERATURE.—A point of interest we have noted in the case of surra in India, and which other vetèrinary surgeons had done in that of penicious anæmia seen in Europe, is the well-worn subject, the paroxysms of increase of temperature, the so-called "anæmia fever" of writers on pernicious anæmia in the human subject. Zschokke* also has assigned a prominent place to this fever, which he found to be of an intermittent type in the horse; and Frohner† has likewise noted a marked rise in temperature on the fourth day, which, with slight remissions, remained high till death.

(*b*) DURATION AND COURSE.—The most important feature of the disease is that there is no history of a definite onset, and that the condition is progressive. There are usually a number of relapses, the average duration of the disease being probably not less than two months. The course is sometimes prolonged to several, usually six to eight weeks; the average duration of the human (pernicous anæmia) being also estimated at "two months." The average of several cases noted by Dr. Evans was two months. It is seen that weak animals succumb sooner, and in some outbreaks the ordinary duration of the disease does not exceed from one week to a fortnight, and, frequently may be less in outbreaks in which reckoning was made after the date of admission on the sick report.

**Schweizer-Archiv. f. Theirheilkunde, Bd.* 25, 1883.
† Archiv. f. Wiss u. Prakt, Thierheilkunde, Bd. 12, 5 *u*, 6 *Heft*, 1886.

(*c*) VARIETIES.—"There is another variety of surra, which is never acute from the beginning, or scarcely even sub-acute. It is truly chronic, may last for months, and occasionally intermits during its course. Though such animals may be seen to be frequently on the sick list for debility due to general loss of blood, indicated by anæmia of mucous membranes, a weak and readily excitable pulse, and swelling of the limbs, etc., they cannot be said at any time to suffer from more than chronic asthenia, and to say the least of it, their appetite remains as good throughout the course of this disease as when they were in perfect health. Such cases occur sporadically, are not very uncommon, and I believe, a number of rejections by means of special casting committees to which every battery of artillery and regiment of cavalry is liable in India are due to this disease. In most, if not all of these cases it is exceedingly difficult to make any impression by the use of internal remedies. They are liable to frequent intermittent attacks of debility, in many cases the animals falling away to a mere skeleton. In the treatment of such cases a most essential element is removal from the place where the disease was contracted. In the acute form, as mentioned before, the disease is very fatal, but in the milder and more chronic form recovery is sometimes noted, although the malady being liable to recurrence it is difficult to say whether this really takes place."—(*Tropical Diseases of the Horse*, 2d Ed., 1888, pp. 44-5.) A few cases have been seen by Dr. Evans to make slow progress in the disease for over a year.

(*d*) FATALITY.—The disease has been characterized as an "invariably fatal" one. There is probably no disease in which the fatality is so high as in pernicious anæmia.

(*e*) URINE.—The urine in most cases is albuminous, and contains much hæmoglobin which is set free by the destruction of the red corpuscles.

(*f*) APPETITE.—In spite of a greedy appetite, debility appears progressive in character. It is scarcely necessary to remark on the importance of this symptom in diagnosis, as all who have written on surra lay special stress on it. Vet-

erinary surgeon Cooper, in his report on an outbreak of surra among ponies in the Berars, states that "the appetite is seldom quite lost, and sometimes an animal continues to feed up to the very last." And Professor Frohner has also noticed it in the German type of the equine disease.

(*g*) PARALYSIS.—Most veterinary surgeons who have witnessed surra in animals in India as well as in Burma mention both an acute and a chronic form of paralysis as commonly characterizing it. And Frohner has noted the same feature in Germany, where this symptom of paralysis was not infrequently present in pernicious anæmia of horses.

We have also noticed pronounced stringhalt, muscular tremors, crossing of the legs, etc., develop during the course of surra, due to effusion on the spinal cord and on individual nerves. And Mr. Thomas Bowhill, F.R.C.V.S., records having witnessed somewhat similar symptoms in Southern or Texas cattle fever (*Veterinary Journal*, July, 1890).

(*h*) TREATMENT.—I attached considerable importance to arsenic in the treatment of cases of surra, with the view of contrasting or comparing the results with those obtained through the use of this agent in pernicious anæmia; and veterinary surgeon Butler* recently reported most interesting results from treatment of cases of this disease in Burma ponies "with arsenic pushed as far as possible." This observation is worth noting, when we remember that arsenic is the only remedy of any value in cases of pernicious anæmia in the human subject. In a recent paper by Professor Osler, in the *Therapeutic Gazette* of the same year, he states that in all cases of pernicious or essential anæmia there was no case of recovery in which arsenic did not form the basis of treatment. I have found that hypodermic injections of quinine have a powerful effect in reducing temperature during the paroxyms. "I know of nothing that has such an antipyretic power as the sulphate of quinine, for it decreases the temperature, retards tissue change, and prevents or modifies periodicity."—(*Tropical Diseases of the Horse*, 2d Ed., 1888, p. 49-

* *Quarterly Journ. Veterinary Science in India*, 1888.

50.) And we are supported in this opinion by Dr. Ranking, who says: "Quinine on full doses appears to control the disease, supplemented by general measures to combat the anæmia and weakness consequent on prolonged illness, chiefly by milk, iron and arsenic." (*Veterinary Journal*, June, 1891.) There is little doubt that if the disease is treated early by quinine, arsenic, iron and perhaps other tonics, by changing the water and making some variation in the location of the animals, great benefit, if not absolute removal of the disease, may be secured. To obtain the most satisfactory results, it should be treated early, before marked tissue changes have taken place. If the treatment be adopted at a later period, it may still be beneficial, though less so than in the early stage.

(*i*) PREVENTION.—Prevention is better than cure. Hence climate and soils favorable to the growth of malarial organisms should always be avoided. According to Parkes the following soils are most so, *viz.*—alluvial soils, old estuaries, deltas, sands, clay, chalk, granite or trap rocks, and particularly vegetable soils at the foot of hills—as, the jungle, or terai, in India.

We have noted that change of locality and climate is most favorable to recovery in these cases. The influence of high annual temperature in producing more pernicious forms of malaria is illustrated in the case of surra, and suggests the removal of all animals suspected of infection to those stations which are known to possess a milder climate in India (and, perhaps, better still, to the hills), which are less suitable to the growth of surra organisms. And, lastly, preventive inoculation with surra parasites artificially weakened, is a most important means of acquiring permanent immunity from the disease, and should be specially practised.

(*j*) INFLUENCE OF SEASON.—It has been seen that surra occurs most commonly after the rainy season in India. There may be many local conditions—susceptibility to climate, season, etc., that may affect the greater prevalence of the disease in animals, in different ontbreaks. Dr. Moore, at a recent meeting of the Royal Academy of Medicine, Ireland,

pointed out that season exercised a great influence on the occurrence of pernicious anæmia also in the human subject.

(*k*) POST-MORTEM APPEARANCES.—Dr. Evans, our first authority on surra, writes: "I am prepared to state positively that this disease is not characterized by any structural organic change; it is purely a disease of the blood." Principal Veterinary Surgeon Oliphant says: "In one outbreak of surra in the 18th Bengal Cavalry, in which one hundred and eighty horses died, I made dozens of post-mortem examinations, and the appearances in all were identical; extreme pallidity of the tissues, with perhaps a trifling serous effusion into the abdomen, etc. In fact, the animals looked as if they had been starved to death." Veterinary surgeon Cooper says, "that the most striking feature is the anæmic condition of the tissues generally and the absence of recognizable lesion." And Zschokke* also states "that none of the principal organs show any marked structural change" in the equine type of pernicious anæmia noticed in Germany.

Mr. Steel lays stress on the presence of gastric ulcers, which he believes to be "characteristic of surra;" and the relation of gastric ulceration to pernicious anæmia formed the subject of discussion lately at the Royal Academy of Medicine of Ireland. (*Lancet*, March 10, 1888, page 474.)

The pathological changes that take place in the various organs and tisssues of the body as a result of surra may be characterised, in a word, as degeneration due to imperfect nourishment. The blood itself is rendered unfitted for the purposes of proper nutrition, and degenrative changes of an adipose character, sometimes leading to disintegration of portions of the imperfectly nourished tissue, take place. When organs and parts so weakened by starvation are distended with anæmic blood which they cannot utilise, sloughs result from gangrene of the imperfectly nourished tissues, as evidenced in the ulcerations of the stomach, etc., noted in this disease. The ulcer itself once formed, suffers from nutritional defect, owing to the impoverished state of the blood,

* *Schweizer Archiv. fur Thierheilkunde, Bd.* 25, 1883.

which prevents the formation of resisting tissue around it, and often leads to perforations. The alimentary mucous membrane in general will be found to be in an anæmic condition, with petechiæ and ulcerated spots the result of disintegration and atrophy. Although the tissues present a blanched appearance, there is a large deposit of fat all over the body, but especially noticeable under the skin. This gives to the tissues a peculiar jaundiced appearance, which is shown to be due to deposition of fat globules seen under the microscope. It is easy to understand how a process of abstraction of blood, a fluid rich in oxygen, by the parasites, would lead to the conversion of albuminoid tissue into fat. The lymphatic glands throughout the body are more or less swollen and œdematous. There is often acute dropsy, with no other post-mortem lesion save extreme anæmia and yellow-staining of the tissues due to fatty degeneration. The heart was found to be the seat of marked fatty changes in cases seen by Mr. Steel, and this is corroborated by the observations of Frohner and other Continental writers. As the lymphatic glands supply lymph corpuscles to the blood, this may account for the excessive production of leucocytes, although how and in what way this extraordinary accumulation of leucocytes in the blood is produced in surra has not yet been clearly explained.

The early symptoms of hepatitis present in surra, which is shown by jaundice of the visible mucous membranes, may be due to congestion of the liver caused by irritation of the worms in the biliary capillaries, leading to their rupture and consequent deposits in gland-substance. There is every reason to believe that when the liver has become so invaded, it is incapable not only of duly performing its own function of secreting bile, which is essential to proper digestion and health, but that it is an abiding pathological source of general jaundice, which, if not removed, may result in the gravest evils —blood disorganization, general anæmia, anasarca, etc.

In those cases in which paralysis of the hinder quarters or other nervous symptoms are well marked, the grey-matter of the cord generally shows blood extravasations and stain-

ing of the nerve cells; but beyond a tendency to congestion and occasional blood extravasation, no lesions are usually discovered in the nervous system.

I think that we may safely formulate a definition of this disease with the aid of the foregoing observations. It is essentially a blood disease allied to, if not identical with, that disease of mankind known as pernicious anæmia. It assumes an acute and a chronic form, but more frequently the latter in the equine species in India, and is known under a variety of names—intermittent and remittent fever, malaria, malarial cachexia, pernicious anæmia, etc.—depending on the stage of development and other features. That an acute form of surra occurs in horses was noted by many observers, and we have already pointed out, in *Tropical Diseases of the Horse*, 1888, p. 41, and elsewhere, that this was in fact intermittent and remittent fever of the horse, which is better known perhaps under the common name of ague, malaria, etc. And Dr. Ranking has recently corroborated our views, and states that in those cases of surra among horses in which he noted the presence of parasites, there was a decided likeness to malarial fever of mankind.

Regarding the true nature of the parasite it will suffice here to state that some authorities regard it as belonging to the class Infusoria, a higher group of Protozoa; while others think it more probably belongs to the class of Mycetozoa (or fungus animalcules) which lie on the confines of animal and vegetable life.

The parasites of surra present a remarkable complexity of organization, that constitutes the great difficulty of classifying and distinguishing species which undergo marked changes of form before arriving at maturity. Hence we may speak of them as occurring in the imperfect or juvenile form, and in the mature form; and it is in accordance with analogy to suggest that the 'flagellated,' the 'crescent,' the 'intracellular, the 'free' and other forms are stages in the development of the same species.

The problem of the connection between *plasmodium malariæ* and the *bacillus malariæ* still awaits solution. How fruitful such a line of investigation may be has been conclusively

proved by the discoveries of Klebs, Tommasi-Crudeli and other writers.

But these inquiries must stand over at present, and we urgently want a practitioner of experience to stir up the fainting energies of our young veterinarians in India. That such a stimulus is greatly needed is clear from the literature of the disease and its present condition. We want readable dissertations on its clinical characteristics, general pathology or treatment and prevention, of value to the general practitioner. It is, I think, full time that we made some decided effort to save from extinction what was known of the disease in the past and which, under careful record, might take an important part in the scientific studies of the subject of surra in India.

CONCLUSION:—

1. That surra is malarial fever among horses, and has a mild and a severe form.

2. It appears most frequently in the pernicious form in India. The influence of high annual temperature in producing more pernicious forms of malaria is well known.

3. In the mild, as well as in the severe form, treatment, unless early carried out, proves of little avail.

4. Preventive measures, and particularly protective inoculation, should be adopted in preference for animals.

5. We know that the disease is taken into the body by the mouth or by inoculation, and that it is not infectious. (Evans.)

6. That it is given out of the body by the excretions, but particularly by the fæces and urine. Hence grounds exposed to affected animals should not be used for grass-cutting in India.

7. Feeding on grass secured from lowlands and lands uncultivated and undrained for any lengthened period, and the drinking of fouled, stagnant, marshy water, being some of the more direct agencies that in the popular opinion produce this disease, attention should be directed to prophylactic and preventive measures.

8. Climate and soils favorable to the growth of malarial organisms should always be avoided.

REPORTS OF CASES.

FRACTURE OF LARGE METACARPAL BONE.

By S. R. Howard, V.S., Hillsboro, Ohio.

Subject, a five-year-old, eight hundred pound running mare, property of S. Bayliss, liveryman. On June 6th, 1891, they were speeding her a quarter on time. Had been in training two months. While doing her best she faltered and fell. I was called immediately. Found large metacarpal of left leg had sustained in its lower third a simple, complete oblique fracture, without displacement.

Prepared a piece of sole-leather as a splint, extending from just below knee to within an inch of toe, and about two-thirds around leg. Slashed it so it would mould well to leg. Had her led to box stall. Placed a man at her head with twitch on her, and gave her a hypodermic of morphine. Had another man steady the ankle while I bandaged.

I first placed a dry roller and padded well behind fetlock with tow. I then dipped leather splint in hot water, moulded it to the part, and secured all with plaster paris bandages, from below knee and including entire foot. Left her in box stall and bedded with sawdust and cut straw.

In ten days crepitation ceased, and there was at no time the swelling usually seen in such cases. The owner decided, in a few days after accident, that bandages were not tight enough. Upon consultation I refused to replace them. In two weeks she began placing some weight upon limb. In five weeks the owner removed bandages and walked her home. Kept her up several weeks and then turned her to grass. Took her up middle of October, lameness scarcely perceptable. Saw him trotting her to a light buggy to-day, (six months from time of accident), and I could see no lameness.

This I consider an exceptionally successful case. I do not use sling where fracture is below knee, unless owner wishes it. In a very short time they get up and down all right.

I measured and compared this mare's fore legs to-day. The one fractured is perfectly straight, but at lower part of frac-

ture leg is enlarged one and one-half inch, tapering upward. She stands square upon it and does not limp. We think she can be driven lightly in the spring, in livery.

FRACTURE OF OS TRAPEZIUM OR PISIFORM BONE.

BY THE SAME.

"As the trapezium is the lever bone of the carpal joint, its development and position are points of very great importance."—*Strangeway.*

Subject, a six-year-old, thirteen hundred pound gelding, property of S. Och & Co. On 9th of January, 1891, he ran off. He galloped down a steep road, leaped over a strong fence at bottom of road, falling, and leaving wagon on opposite side of the fence. Being assisted to his feet, he was found to be exceedingly lame in one fore limb. Was walked two miles to my hospital. He kept the knee joint constantly flexed and foot off the ground. He trembled for several days, and seemed to suffer considerably from the shock. Occasionally I gave him hypodermics of morphine.

Upon examination I found trapezium fractured in several places, and, what is strange to me, no swelling occurred for at least three days. The articulation, I am sure, was not injured. Placed him in a box stall, and, upon demand of owner, put him in a sling. Anodyne liniment to knee. Let him out of sling in six days. He could lie down and get up handily. In about ten days he could stand full share of weight upon this leg, but showed considerable pain upon bringing foot to ground in walking, or upon some one flexing metacarpus.

There was by this time some enlargement of a bony character, which has remained. He gradually became better of his lameness, so that in about seven weeks they began using him, although he was considerably lame in trotting, but not at all in walking.

Since six months after accident and to present time, he has not tumbled or limped in the least in trotting or walking. The results of fracture of the trapezium in this case are, you cannot bring the foot within six inches of radius, and affected knee is two inches larger in circumference than the opposite.

This bony enlargement is not at all unsightly, and to see him trotting along with a load you would not suspect the above changes. To all purpose he is as sound as ever. His owners (butchers) sometimes drive him quite a number of miles after lambs and calfs, which he draws into town without flinching in the least or stumbling.

POISONING BY ACONITE.

By Richard R. Morrison, D.V.S., White Plains, N. Y.

The patient was a bay gelding, ten years old, about sixteen hands high and in good condition. His owner, (a pedler), told me that the animal had had an attack of colic, and that he had given him half-a-pint of gin and an ounce of nitre, and as the horse still seemed in pain, an hour afterwards he called a friend to see him. The friend told him that it was only a slight case of colic and that he would stop it in a few minutes; he proceeded to do so by sending to the drug store for a two ounce vial of tinct. aconite, ten drachms of which he gave to the animal. Some of the bystanders at this stage asked if that was not a large dose, but the amateur doctor replied that two ounces were not too much for a horse and that he always treated colic that way. (I afterwards secured the bottle, measured the contents and found that six drachms remained). However, the owner became alarmed after that and sent for me.

When I arrived I found the animal lying down, and with some difficulty we got him on his feet; but he could not stand without assistance; temperature 101°, pulse almost imperceptible and respiration irregular. The animal seemed to have much difficulty in the act of respiration; (he would breathe normally for three or four respirations and then would stop as if there was a paralysis of the respiratory muscles and then in a few moments would respire normally as before). There was also very marked diaphoresis and insalivation, the labial and nasal muscles were contracted, disclosing the teeth; the animal's neck was arched, and he appeared to be making continual efforts to swallow and was trembling violently.

I at once gave him a hypodermic injection of tinct. digitalis ʒi and tinct. strophantus ʒss, which I followed by spts. ammo. aromat ℥ss, acid tannici ʒi, in about four ounces of whiskey. As soon as we let the animal alone he lay down, and in about fifteen minutes I gave him another hypodermic injection of digitalis and strophanthus as before, and as he was evidently in pain I gave him four grains of morph. sulphat. hypodermically. I then left instruction to give the animal spts. ammo. aromat. ʒi acid and tannici ʒss in two ounces of whiskey every half hour until I returned.

When I returned in about an hour and a half, I found the animal standing up and evidently much relieved, his pulse was 50, but irregular; salivation was decreasing; respiration 12, but was still perspiring freely; the bowels and kidneys were working freely. I gave him another hypodermic injection of digitalis and strophanthus as before, and left the following prescription:

℞ Tinct. Strophantus, ℥ss.
Tinct. Digitalis, ℥i.
Acidi Tannici, ʒii
Liq. Ammo. Acet., ℥iii
Spts. Vini. Rect. Dil., q. s., ft. ℥xvi.

M.—

Sig.—Two ounces to be given every hour.

I called again later that night and found the horse out of danger, functions all being normal, except that he was dull and listless and not inclined to eat; but I did not alter the treatment except that I gave the medicine in longer intervals, and on the third day the animal went to work and seemed none the worse for his experience.

I thought that perhaps the animal might have spilt most of the aconite when it was given, but on careful enquiry from the bystanders they said that he hardly spilt any of it, so I presume he must have swallowed at least ℥i of it; so I suppose that the tannic acid formed with it the insoluble tannate of aconite and in that manner, with the aid of the stimulant, saved the animal's life.

AMERICAN VETERINARY COLLEGE—HOSPITAL DEPARTMENT.

PROLAPSUS UTERI—REDUCTION—AMPUTATION—OVARIAN ABCESSES—DEATH.

BY E. B. ACKERMAN, D.V.S., House Surgeon.

The patient was a very large St. Bernard bitch, about one year old, which had been imported for breeding purposes. She was brought to the hospital on the 29th of August, without any history of her condition, except that she had never been lined.

She had prolapsus uteri, exhibited by a large red tumor about the size of a muskmelon, protruding through the vulva, and presenting in its center a *cul de sac*. It was somewhat cold to the touch, and not painful. The mass was quite indurated, and on that account the possibility of reduction was doubtful; indeed, it was only after two days that this could be done, the projecting uterus being previously fomented and protected, and having somewhat diminished in size. The reduction, however, was difficult, and could not be accomplished until an hour of pressure had been applied with the hands, the bitch being kept with her hinder extremities elevated. A *repoussoir*, made with a piece of smooth stick, was pushed against the uterus, at the neck, to assist the work of returning the organ into the pelvic cavity. The reduction having been made, a kind of opiate pessary made with a sponge was pushed into the vagina, the vulva closed with two sutures, and an ice bag put over the parts and kept in place with a bandage.

This proved but partially successful, the prolapsus returning after a few hours. Reduced a second time, it seemed that the trouble was ended; and though there was considerable inflammation and discharge of pus, etc., the dog was sent home in a few days convalescent.

Four days later she was returned to the hospital. Submitted to the same manipulations, the uterus was again reduced, and suppositories of opium and bandages were used, but failed. A large rubber pessary was then introduced, and

left in place for three days. When taken off the animal seemed to be radically relieved, as for two weeks no further trouble appeared. After this length of time, a slight tendency to the return of the trouble showed itself. The opiate sup pository and india rubber pessary proved, this time, of no avail. Cold water irrigations seemed once again to bring on a good result, and for about three weeks the bitch seemed to enjoy perfect health.

During that time the owner had been notified of her condition, and though he had forbidden amputation in any case, it was feared that the operation would become necessary, should the prolapsus return. And it did return towards October 25th, being, as on the previous occasions, indicated by the continued straining of the bitch, as if trying to defecate.

This time all efforts to reduce the organ remained fruitless, and the owner was notified of the state of affairs. He paid no attention to our notices, and after waiting nearly a week, the condition of the bitch becoming worse, she was ætherized and made ready for the operation.

The inversion of the organ was not complete, nor could it be made so. The walls were so thickened and hard that the *ecraseur* broke during the amputation. A strong ligature was then applied in its place, and excision made with the knife.

The operation was almost bloodless. The animal remained comfortable, and was doing well for the first three days, but at the end of the third day she refused her food; her temperature rose to 103⅕°, her pulse to 120, and she died during the following night.

On opening the abdominal cavity two or three quarts of dirty, offensive fluid escaped. There was localized peritonitis in the vicinity of the genital organs. Both ovaries and sub-lumbar glands were enlarged and filled with abscesses. The examination of the removed uterus having revealed that the internal surface showed only the opening of one cornua, careful dissection of the pelvic cavity showed that there was only one of those appendages of the uterus, there remaining in the pelvis but the remainder or strings of one cornua, corresponding to the opening that existed in the uterus. There

was also only one broad ligament. With the exception of the right kidney enlarged and the lungs somewhat congested, all the other organs were normal.

The interest of this case rests in the abnormal development of the uterus and the suppurative ovaritis, as these may be considered as direct and indirect causes in the repeated exhibitions of the prolapsus. If the disease of the ovaries may be considered as the direct cause, by giving rise to straining through reflex action, is it improper to suppose that the prolapsus might not have taken place even with the diseased ovaries, had the uterus been properly held in position by its two cornuæ and their broad ligaments had they been present?

A LARGE FIBROMA OF THE HOCK.

By The Same.

A steel-gray gelding, seven years old, was brought to the hospital with the following history, November 16th, 1891.

Some fourteen months previous, one day while the owner was cleaning him, he noticed a small pimple on the outside of the near hock. He did not think it amounted to anything serious, in fact it disappeared for two or three weeks, to return larger. The owner blistered it, but this seems to have put life into the growth, and it began to enlarge rapidly. It was then blistered and blistered again, until seven applications of the ointment were made without result. The tumor continued growing. A seton was passed through it, but no good was gained by it. Iodine was freely used, but failed to effect any improvement. Lately, nothing has been done for it, but though only an eye-sore, as the horse is not lame and seemed not to be incommodated by it, the owner desired it removed if possible.

The tumor was comparatively well defined, hard, painless, somewhat moveable and had all the appearance of being of a fibrous character. Explored with a fine trocar, it seemed to be hollow in its center, but yet no fluid escaped through the exploring opening, and its removal by dissection was decided on.

The animal being thrown, a longitudinal incision was made in the long axis of the growth, and the skin over it dissected by a T incision, it being necessary to enlarge the opening. Raising it by means of a piece of tape run through it to assist in holding it up while the cellular tissue (somewhat thickened by the repeated blisters) was divided, its complete resection from its solid attachment was made with the ecraseur. Small blood-vessels were ligated during the operation.

The wound was packed with oakum, and closed with interrupted sutures, having a place for drainage at the bottom. The stitches held well for a few days, and the wound was kept from gaping by means of adhesive plaster.

The tumor weighed eleven ounces and a half, and consisted of a large fibrous mass, encapsulated by a dense envelope, and containing in its center a gelatinous substance resembling coagulated synovial fluid—a condition which explains the sensation obtained when the tumor was first explored, viz., that it was hollow in its center.

VETERINARY SANITARY SCIENCE.

ACTINOMYCOSIS BOVIS.

By W. L. W.

Probably the most interesting case in the legal history of veterinary sanitary science or meat inspection in the United States was the suit of Greenhut et. al. vs Pearson et. al in the circuit court of Peoria Co., tried at Peoria, Ill., Nov. 12 to 24 inclusive, before Judge Shaw.

J. B. Greenhut, the chief plaintiff, is President of the whiskey trust and with his colleagues is heavily interested in cattle feeding, utilizing for this purpose the distillery refuse. J. M. Pearson was, at the time when the ground for the present action was laid, the Chairman of the State Board of Live Stock Commissioners of Illinois, a board created by the laws of Illinois for the purpose of controlling or extirpating contagious or infectious diseases among domestic animals.

Upon the advice of the State Veterinarian, in conjunction

with that of several of his assistants, as well as that of several prominent veterinary and human sanitarians, this state board had placed in quarantine about one hundred and thirty cattle affected in varying degrees with actinomycosis, and refused to allow the affected animals or their carcasses to be placed upon the market, and finally, except those who died in quarantine or were destroyed of the purpose for making autopsies, were shipped to Chicago and "tanked" and their products used for commercial purpoes.

Mr. Greenhut and his associates in ownership brought suit to recover the value of the cattle for beef purposes at a sound meat valuation.

Their first witness was Dr. Hickman, chief inspector for the Bureau of Animal Industry at Chicago, Ill.

In his direct evidence he maintained that actinomycosis was transmissible by inoculation from animal to animal and from animal to man. He had had an extensive experience with the disease and had studied it extensively in connection with his duties as a meat inspector.

On cross-examination he became badly confused, admitted that he had made no critical study of the disease, had seen *no* post-mortem examinations worthy of relation, knew nothing of the disease in man, did not know how many cases of actinomycosis had been discovered and reported in man in his own city during the past year, was certain that man could not get the disease from affected cattle but that they most likely contracted the disease by eating barley or grass.

After admitting that the actinomyces found on vegetation, in affected animals, and in man were all identical, and that man or animals might contract the disease by micro-organism from vegetation becoming transplanted to an abraded surface or other suitable ground for growth, he was unable to explain why the actinomyces growing in animal tissues were not equally competent to cause actinomycosis in other animals or man in like conditions. In his capacity as inspector of export cattle he admitted that he refused to tag for exportation cattle affected with actinomycosis, and when pressed for his reasons for condeming these for live export after he had sworn their

meat was perfectly fit for human food, he could give no clear explanation of his actions but could only say that he held them for post-mortem examination, although he did not himself make such post-mortems, nor did he personally know that such examinations were made.

G. G. Heeps, a "country cow doctor," from Annaman, Ill., was called to support Dr. Hickman's theories as to the disease, his evidence developing nothing material over that of Dr. H. Dr. Vogel of Chicago, who represented himself as a graduate of Vienna and Munich veterinary schools and with a practical experience of over fifty years, fully substantiated Dr. Hickman's position, and said (through an interpreter) that no matter how large the actinomycotic tumors, nor how great the suppuration or decomposition, the meat of the animal, except the tumor itself, was perfectly fit for human food. This, he said, was the opinion of the best German authorities, and when pressed on cross-examination for the names of his authorities he cited Friedberger and Frohner's Spec. Path. and Therap., and these authors he was forced to admit described actinomycosis as an infectious disease. There seemed to be a total want of abhorrence in his nature for any diseased or decomposing meat, to such an extent that his evidence was repulsive to every one.

Dr. O. Schwartzkopff, a graduate of Berlin veterinary high school and now dean of the veterinary department of the University of Minnesota, said that actinomycosis was not contagious but could be transmitted from animal to animal experimently, bnt that while experimental inoculation would produce the disease, accidental inoculation (even in same parts) would not transmit it. The actinomyces were too large to pass through the capillaries, hence could not be disseminated by means of the circulation. The disease does not, according to his researches, affect the meat of the animal, but only the head and neighboring lymphatic glands. He had not seen it in the muscles or spleen. Upon being shown Ponfick's "Aktinomykose des Menschen" with colored plates showing the disease in muscles of heart and in the spleen, he admitted that it did occur in those parts and that there was

no way known to him to account for the disease in these organs except the micro-organisms be carried by the circulation.

On cross-examination he admitted that he had recently said over his signature, and that such assertion was true, that in his mind parts of animals affected with actinomycosis were unfit for human food, but still maintained that the disease could not be transmitted from animal to animal nor from animal to man by accident, but that it could be contracted by either from accidental inoculation with the same germ growing upon plants. When asked to explain why the actinomyces of plants would, in his opinion, produce the disease in animals and the identical micro-organism from animal tissues would not, he could not answer.

Dr. F. S. Billings, professor of pathology and histology at the Chicago Veterinary College and for several years a student in Germany, was called on behalf of the plaintiffs.

Complaining of illness, the cross-examination was made very brief, and mainly directed toward showing his egotism. He asserted that he had made the infectious diseases of animals his sole study for a number of years, day and night. He was quite positive that he knew a *great deal* about infectious diseases of animals, more than all other scientists on the American continent, and admitted that before coming upon the stand that he had asserted he was "the Jesus Christ of infectious diseases in America."

The defendants called as witnesses, Prof. A. H. Baker, of Chicago Veterinary College; Dr. Chas. N. Hewitt, Secretary Minnesota Board of Health; State Veterinarian Casewell, of Chicago, Ill.; Assistant Veterinarians Scott of Peoria and Page of Rockford; Dr. Nattress, of Delevan, Ill.; W. L. Williams, formerly Assistant State Veterinarian, of Bloomington, Ill., now Professor of Veterinary Science in Perdue University, LaFayette, Ind., and affidavits were submitted from Prof. James Law, of Cornell University; Dr. A. Liautard, Principal American Veterinary College, N. Y.; Dr. Paul Paquin, of Mich.; Prof. Jos. Hughes, of Chicago Veterinary College; Doctors of Medicine Ochsner, Murphy and Schirmer of Chi-

cago, etc. These witnesses all gave essentially the same testimony as to the nature of actinomycosis; that it was due to the invasion of the tissues by the ray fungus or actinomyces, which was probably obtained originally from vegetable food products, and gained entrance into the system through wounds, abrasions, glandular openings or very delicate membranes; that it had been transmitted experimentally from animal to animal and from man to animal; it is contagious, although not highly so, and can, so far as science teaches us at present, be as readily transmitted by transplantation of ray fungus from animal to animal or animal to man, as by means of the same fungus conveyed from a plant to animal or man; that the actinomyces found on vegetation, in the tumors of cattle and in actinomycosis of man are all, so far as is known, identical.

Many of the witnesses had made post-mortem examinations of affected cattle, and had found the disease in bones of jaws, face and head, in lymphatics of head, throat, thorax, deep inguinal region, and those lodged in the intermuscular connective tissue of the legs; in the tongue, pharynx, lungs, liver, spleen, stomach, bowels, mesentery, prepuce, etc.

The disease, in their minds, is dangerously contagious, in the sense that the life of the affected patient is greatly jeopardized. They believed the disease capable of entering into and passing through the lymphatic and hæmal circulations, and based their conclusion on, first: the size of the club-shaped mycelia of the ray fungi (without reckoning the necessarily smaller spores which the mycelia bear,) which are not generally so large as the blood corpuscles, and hence capable of passing through the capillaries; second, the presence of actinomyces in the spleen and in heart-walls, etc., where it could not well gain admission except through the circulation. The external manifestations form no criterion as to internal distribution of the ray fungus, so that an animal with but a small external tumor or a mere cicatrix, after undergoing a so-called cure, may show distinct evidence of the disease in various internal organs, and since the parasite is microscopic, it is impracticable to say that a portion of an affected animal is free

from invasion, hence the meat should be condemned as unfit for human food.

The defense also submitted in evidence a report made to plaintiffs by Prof. E. A. A. Grange, State Veterinarian of Michigan, Dr. V. T. Atkinson, deceased, late State Veterinarian of Wisconsin, and Dr. Vogel, of Chicago, who were called as experts to examine the cattle in question, and reported that while the disease was doubtless actinomycosis, they did not consider it "dangerously" contagious, in the sense that it was readily transmissible.

They further submitted a report of veterinarians Casewell, Scott, Page and Williams of an examination of the cattle in question, and of post-mortem examinations on three of the affected animals, which showed the disease in various internal organs.

Evidence was introduced in behalf of plaintiffs, citing cases where affected animals had co-habitated with healthy animals for long periods of time without result, and the defendants introduced considerable similar evidence to prove the contrary, by citing cases where a large percentage of certain cattle herds had become affected apparently through cohabitation with diseased animals.

The ordinary evidence as to the history of the case in question, disposition of the affected animals, official acts of the commissioners, etc., was introduced. After being out two days, the jury reported that they could not agree, and hence were discharged. It is probable the plaintiffs will continue the case and demand another trial.

It is to be regretted that some decision was not reached by the jury, in order that the case might be appealed to the higher courts and some precedent established for dealing with actinomycosis in the future.

The question of the possibility of rendering the flesh of actinomycotic animals fit for food by thorough cooking did not enter prominently into the case.

The two principal questions contested were the transmissibility of the disease and the fitness of the carcass of the affected animal for human food, without relation to cooking.

SOCIETY MEETINGS.

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular meeting of the Massachusetts Veterinary Association was held at 19 Boylston Place, Boston, Wednesday evening, October 28th, 1891, at 7:30 o'clock, President L. H. Howard in the chair.

Members present: Drs. Bryden, Blackwood, Burr, Howard, Hadcock, Marshall, Osgood, Winchester, Winslow and the Secretary. Honorary member: Dr. Stickney. Guest: Dr. E. F. Harrington.

Minutes of the last meeting (held in June) read and accepted.

Dr. Osgood thought that the name of anyone proposed for membership should lie over a month before being balloted upon, so as to give ample time for looking up the applicant's record.

Dr. Bryden thought that we ought to act in accordance with our State charter. At the same time if there was any bugaboo it ought to be gotten rid of. The question is upon suspending the clause requiring a thesis as a requirement for admission, for a period of two years from last April.

Ballot taken. Resulted in seven votes, all in the affirmative.

The Secretary reported a letter from Dr. Donaldson, of Clark University, acknowledging receipt of the spinal cord of the old pony killed for springhalt at Ward's wharf last summer, and saying that he would report the result of the microscopic examination as soon as it was completed.

The committee, consisting of Dr. Winchester and the Secretary, which met a committee from the Board of Control of the State Agricultural Experiment Station at Amherst, consisting of Pres. Goodell and Secretary Sessions, of the State Board of Agriculture, on Thursday, July 2d, at the Commonwealth Building, Boston, to talk over the advisability of appointing a veterinary pathologist at the State Experiment Station, reported that the committee that they conferred with

were favorably impressed with the idea, and that President Goodell was to formulate a plan of procedure, but that unfortunately he had gone abroad for his health and could do nothing about it at present.

The Secretary reported having seen Mr. Sessions that afternoon, who said that he had not yet given the matter any thought, as he was waiting to see what President Goodell advised doing.

Motion made by Dr. Osgood, and seconded by Dr. Winslow, that a vote of thanks be given the committee, and that its report be accepted, and that the committee be continued with full power to act. Carried.

Application for membership received from Dr. E. F. Harrington, and referred to the Executive Committee.

The Secretary reported the resignation of Dr. A. W. Clement, of Baltimore, who resigned because he had not lived in Massachusetts for three years, and therefore failed to avail himself of the benefits of membership in the Association. Moved by Dr. Winchester, and seconded by Dr. Osgood, that Dr. Clement's resignation be accepted with regrets. Carried.

Dr. Osgood then filed a request in writing with the Secretary, to still further amend the Constitution by providing that Article III. shall be changed, so that applications for membership in this Association must be made in writing to the Secretary, with the presentation of the applicant's credentials. Said application must be presented to the Association at its next regular meeting, at which time the Secretary is to present the applicant's credentials to the Executive Committee, which after examining the same, shall report to the meeting. If favorably reported on, the name of the applicant shall be laid on the table till the next regular meeting before being voted on. During this time the Secretary shall notify members of the Association in writing of applicants to be voted upon at each regular meeting. If accepted, the Secretary shall notify the applicant of the same.

Dr. Stickney reported the case of recovered cœcal fistula in the bay mare killed at Ward's wharf this afternoon.

A vote of thanks was given Drs. Stickney, Saunders and

Peters, for their interest in buying the mare and keeping her until now for post-mortem examination. A number of the members expressed their willingness to contribute their share towards the expense of the same. (A detailed report of the case will be written later, and a copy kept for the Association, and copies given the veterinary journals).

Dr. Winchester then reported four very interesting cases, as follows: Fistula of Steno's duct in a horse; two spleens in a colt, one abnormally large; a case of canine rabies, having a long incubative period; and peritonitis in a horse, following the rupture of the peritoneal coat of the stomach.

Moved by Dr. Blackwood, seconded by Dr. Marshall, that Dr. Winchester be given a vote of thanks for recording these cases. Carried.

Meeting then adjourned.

AUSTIN PETERS, *Secretary.*

Regular meeting of the Massachusetts Veterinary Association held at 19 Boylston Place, Boston, Wednesday evening, November 25th, 1891, President L. H. Howard in the chair.

Members present: Drs. Bryden, Blackwood, Becket, Burr, Emerson, Hadcock, Howard, Marshall, Winchester, and the Secretary. Honorary member: Dr. Stickney. Visitors: Drs. W. W. Noyes and E. T. Harrington, and also Mr. Kendall, of Sterling, Mass.

Minutes of last meeting read and accepted.

It was moved to amend the Constitution by providing that names of applicants for membership be laid on the table for one month before being acted upon. Ballot taken, resulting in nine votes cast, all in the affirmative.

Committee appointed to confer with a committee from Board of Control of the State Experiment Station, reported progress. Motion made by Dr. Hadcock, and seconded by Dr. Blackwood, that report be accepted. Carried.

Executive Committee reported through the Chairman, Dr. Marshall, favorably upon the credentials of Dr. E. T. Harrington. Ballot taken on the question of his admission resulted in eleven votes cast, all in the affirmative.

Secretary directed to write personal letters to Dr. J. M. Parker, of East Rindge, N. H., and to Dr. W. A. Hitchcock, of Malden, applicants for membership, informing them of the conditions of membership in this Association.

Moved by Dr. Winchester, and seconded by Dr. Hadcock, that the Secretary have a number of copies of the Constitution printed, together with a number of circulars and forms, and mall them, at his discretion, to members of the veterinary profession. Carried.

A paper upon "Springhalt," by Dr. Williamson Bryden, was then read, being a report upon his treatment of the old black gelding kept for experimental purposes for this Association by Andrew Ward, of the N. Ward Co's wharf, Boston, and killed for autopsy July 27th, 1891, together with the essayist's views upon this affection.

A spirited discussion followed, in which the members and visitors took part. Most of those present did not agree with the essayist in all of his views, especially the idea that in springhalt, spavin and the like, the first change is in the foot, and that the other troubles are consequent upon it, believing, on the contrary, that the alteration in the shape of the foot is the result of the disease above. Nearly all who had seen the horse before and after treatment by Dr. Bryden, admitted that there was an improvement in his condition at the end of the course.

The Secretary read a note from Dr. H. H. Donaldson, of Clark University, in which he reported that he had nearly finished the microscopic examination of the horse's spinal cord, from the lumbo-sacral region, without finding any pathological changes. If before finishing the examination any changes were found, it would be reported to the Association.

Dr. Howard brought the bones of the near hock, the cuboid scaphoid, large and small cuneiform, which were anchylosed together and to the metatarsal bone. There also appeared to be a little ulceration upon the trochlea of the astragalus, but the bones had been soaked out in rather a strong pickle, rendering this uncertain.

Moved by Dr. Marshall, and seconded by Dr. Becket, that the essayist be given a vote of thanks. Carried.

Meeting then adjourned.

AUSTIN PETERS, *Secretary.*

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular meeting of the Keystone Veterinary Association was held at the College of Physicians and Surgeons, Thirteenth and Locusts Streets, Philadelphia, November 7th, 1891.

Meeting called to order by the President, Dr. W. Horace Hoskins.

The following members answered the roll call: Drs. W. B. E. Miller, H. P. Eves, Chas. T. Goentner, Alex Glass, W. H. Hoskins, J. B. Rayner, W. S. Kooker, Chas. M. Cullen, R. G. Webster and W. B. Werntz.

Minutes of previous meeting were read and approved. The President appointed Drs. Eves, Rayner, Miller and Goentner to fill vacancies caused by absence in the Board of Trustees. A recess of fifteen minutes was taken. Upon reconvening the Board of Trustees reported adversely upon the application of Dr. MacFayden for associate membership; and advised the acceptance of the resignation of Dr. M. W. Drake. On motion the report of the Board of Trustees was accepted. Dr. Glass, the essayist of the evening, read a very instructive paper on "Bench Show Distemper in Dogs."

Dogs gotten in the very pink of condition are sent from all parts of the country to the show. After or during the latter part of the show they manifest a disinclination to feed, are drowsy, languid, the coat unthrifty in appearance, eyes watery, nose dry, pulse rapid, temperature high, with, in some instances, cough. These constitute the general symptoms of bench show distemper, which is distinguished from the real or genuine distemper by the symptoms, in the majority of cases, being of a milder form. We have three different conditions resulting from bench show distemper which are of a serious nature. First, pneumonia. 2d, the abdominal. 3d, the nervous.

In the first or pneumonic condition we have all the symptoms observable in other domestic animals, with the additional symptom observable in dogs suffering with lung trouble, that of always remaining in a sitting position. In the second, or abdominal condition, we have enteritic symptoms with either a diarrhœa, dysentery, or the opposite, excessive constipation. This condition as well as the first requires very careful nursing, with rational treatment, and the result will be a complete restoration to health. The third or nervous condition is the one in which the results of treatment are generally very unsatisfactory. The causes of bench show distemper in a great measure are due to the sudden change in the feeding and housing of the dogs. The Spratt's system of housing dogs at shows is a prolific source of contagion. The benches or cages are moved from one place of showing to another throughout the whole country, with only a very superficial cleansing with water. The percentage of cases of bench show distemper would be much less if these kennels were thoroughly disinfected, and more care given to their cleansing.

A vote of thanks was tendered Dr. Glass for his paper.

Dr. R. G. Webster reported the following cases: On the 12th of April, 1891, was called to attend five cows of a man's herd which he said were acting very strangely. I found the five cows in stable, and at a glance they appeared to have nothing the matter with them, as they were eating hay at the time. Their coats were glossy and in fair condition, but upon a closer examination found a very serious trouble. Accidentally touching one upon the back she almost fell to the ground, losing all power and control of herself; her legs were almost useless. She then showed a very wild look out of her eyes, as though in distress. On taking my hand off she soon went to eating again. Temperature and respiration were normal, pulse weak but not fast. Could handle her anywhere over body except spine, without her showing any distress. The history the owner gave was that the week before he had an old cow to get down who could not rise again. He, thinking she was paralyzed from old age, killed her, thinking nothing

more about it until four days later, when on going into the stable in the morning he found the five as before mentioned. I asked what he was feeding, and he said malt dust and clover hay were all that they were getting. Asked him in what quantity he was feeding the malt; he said that he had been feeding it all winter with corn meal, but his corn running out about a month before had been since then feeding the malt alone; was feeding one ton every ten days to twenty-seven cattle, soaking each feed for twelve hours in three hundred quarts of water. I looked at hay and malt, but could see nothing wrong with either, or anything about the barn or yard, as everything was clean. I, thinking the trouble arose from feeding malt too heavily, had it discontinued, and gave the cows tonics. I looked at the rest of the herd out in the lot before going away; they appeared to be all right. Did not see them on the 13th. On morning of 14th the owner was at my office at 6 A.M. reporting eight more affected in the same manner. I advised him to send for State Veterinarian Bridge, which he did. I got to his place about 10 A.M. He had turned the cows out into the lot. I looked them over and found the whole twenty-seven more or less affected, two not being able to get out of the stable, one down, not able to get upon her feet, but was eating; was very hungry; gave her a bucket of water; drank it down without any trouble in the least; gave another bucket; drank it; wanted more; gave her some dry bran; licked at it as any healthy cow would. Her temperature and respiration were normal, pulse weak. The other, apparently the weaker of the two, could get up and down; was hungry and thirsty as was the first.

In looking at cows in field they would be eating grass, then all at once stop, stamp their feet, kick at belly, then start to run as if bees were stinging them; would elevate tail over back and run this way a few minutes, then stop and go to eating again. They did this every five or ten minutes. Others not so bad would stamp their feet; did nothing for them. Dr. Bridges came on the 16th, examined and diagnosed the trouble to be in the clover hay, which was at once

stopped. Gave each cow large doses of mag. sulph., followed by tonics.

On the 17th I for first time saw the cows come out of stable. Here was where the trouble showed itself the most, coming from dark stable to the light. The first few steps the fetlock would hardly bear them, would turn and almost throw them down. As soon as they came to the light, they would start back, stare around, blink their eyes, were not able to distinguish objects. One cow especially could hardly get through an opening twelve feet high by fifteen wide, making several attempts before getting out. She wonld start out, then step back, start again, bend down until belly almost touched the ground; after doing this several times she got down upon her knees, rested in that position a few seconds, then got up and passed out without any trouble and went to eating. She did this three mornings in succession before improving. The whole herd went through these actions more or less in getting out of the stable; all were very thirsty; drank a great deal of water. Of the two which were in the stable, the one that was the weakest but able to stand got down in the night and died, while I was looking at the others. She ate some hay and drank water early in the morning. The other one still down, but eating and milking some. I saw them again in the evening; were apparently much better after standing out all day. The stiffness and trembling was improved;

18th.—Came out of stable much the same as yesterday, but did not seem so nervous, and it soon passed off after being out. The cow that had been down since the 14th died during the night.

I held a post-mortem on the two which had just died. The first thing noticed upon opening them was a peculiar smell, different from what I had ever experienced in any other post-mortem. As near as I can describe it, it was like rotten eggs. I found all the internal organs in a normal, healthy condition except the stomachs. The mucous membrane was almost entirely separated from the wall of the rumen and manyplier, leaving it of a purplish hue, looking very much as if it had lain in water for several days. Both

cows were the same; stomachs were in the same condition.

19th.—Saw them come out of stable; the whole herd came out better than yesterday; had hay in bunches about the lot; cows chased and hooked each other in their eagerness to get at it. An old cattle dealer who was looking at them at the time remarked that those cows were not sick, as sick cows would not eat in that way. 20th.—When cows were coming out of stable I detected one that was very starey. I had her at once put back, and gave mag. sulph. 1lb. The herd generally seemed more stiffened up, not as well as yesterday. Thinking the tonic too strong for the condition the stomach was in, changed it. Put lime in drinking water, as they were drinking immense quantities of it, and then bloating up; would go to water trough looking thin, in half hour would be bloated up so as to be hardly able to get around.

Some of the man's neighbors told him that if he would only turn his cows out upon good pasture it would be the end of it. He thought he would try one first. This one had been very bad, but improving nicely; he turned her out into his lawn for about one hour, where the grass was good. She then went to the water, drank, but did not get ten feet from trough before she fell. She lived for a week, but did not get upon her feet; at the end of that time, seeing no improvement, had her killed. 21st.—Did not see them come out of stable; bloated some after drinking water. 23d.—One old cow which I had advised being kept out of stable all the time had been getting along nicely. The night being cold, owner put her in; she got down in the night; could not rise in the morning; lived two days, then killed her. I did not see them again until the 27th. They were then all doing well, picking up in flesh and giving almost as much milk as before. The four cows which died were his best milkers, and he was feeding them more than the rest of the herd.

Dr. Hoskins was of the opinion that the trouble was due to some mould fungus or germs, which had produced the result, similiar in many instances to the so-called cerebro spinal meningitis in horses. Dr. Rayner was sure that it was due solely to the feeding of malt dust, but could not ex-

plain what there could be in the food that would produce the results cited. Dr. Kooker gave the composition and manner of preparation of what is sold as malt dust.

The cases cited were of great interest to the members present, and remarks were made and questions asked by every one present.

The subject of mycotic stomatitis was brought up for investigation. There were over three hundred cases reported as having been treated by the members present. Dr. W. B. E. Miller stated that it was due to a vegetable irritant, likely of the ergot group. All cases were of a mild character, none of which proved fatal.

Treasurer reported collection of dues for evening thirty-nine dollars.

Dr. Hoskins announced that a drug and its uses would be discussed at the next meeting.

On motion adjourned.

W. H. HOSKINS, *President.*

W. S. KOOKER, *Secretary.*

ILLINOIS VETERINARY MEDICAL ASSOCIATION.

The Illinois State Veterinary Medical Association held its regular annual meeting, Nov. 17th and 18th, at the Sherman House, Chicago, Ill., being presided over by President S. S. Baker, of Chicago.

On account of unavoidable absence of the Secretary and Treasurer, the President appointed Dr. M. Wilson Secretary *pro tem.* and Dr. N. I. Stringer Treasurer *pro tem.*

The roll being called, the following members responded: Drs. A. H. Baker, S. S. Baker, G. Z. Barnes, H. E. Delavergne, Thos. Hope, J. A. Judson, O. J. Lanigan, W. J. Martin, H. W. Parkinson, C. A. Pierce, H. G. Pyle, J. F. Ryan, C. E. Sayre, J. S. Spangler, R. W. Story, R. J. Withers, S. V. Ramsey, A. G. Alverson, D. McIntosh, N. I. Stringer, M. Wilson, R. G. Walker, F. S. Schoenleber, T. J. Gunning.

The minutes of the previous meeting were read and approved, and correspondence from Drs. J. T. Nattress, J. F.

Pease, Paul Paquin and S. H. Kingery were read, regretting their absence.

President S. S. Baker then gave his annual address, making comments on the past history of the Association, and suggesting new ideas for improvement in the future, as follows:

GENTLEMEN:—This Association has entered on the ninth year of its existence. We have held meetings during these nine years when we have had barely a working quorum, and at one meeting in particular I remember, held at Joliet in 1885, there were but six members present—not enough for a quorum—but we did more business at that meeting than was ever done before or since. We revised Constitution and By-Laws, etc., etc., only to have our work thrown out at the next meeting as illegal, but of late we have had no such trouble. We have gained in the number of our members, and the zeal with which they attend has grown with the increased membership. The meetings of this Association are not merely for the purpose of mutual admiration, but for a specific purpose, viz.: The cultivation of fraternal feelings among veterinary practitioners, the elevation of the veterinary science to an equal rank with other scientific branches of medicine, the mutual improvement of its members, by the exchange of ideas, the presentation of such cases of diseases, together with their treatment, as may be worthy of note, and to provide ways and means to secure legislation to regulate the practice of veterinary medicine and surgery in this State, the importance of which is patent to all. The importance of such legislation is not so much for the protection of the qualified practitioner as for the protection of the agriculturist against the ignorant empirical practitioner.

Because we failed once in securing legislation is no reason we should give up in despair. The medical profession strove for ten years before they got a bill passed to regulate the practice of medicine; therefore I would urge upon you the appointment of a committee for that purpose and each of you get your representative interested in the work and keep at it till we get the desired legislation.

The advancement in the veterinary profession in

the last few years has been great. We are now recognized by the Federal Government and by nearly all State Governments. We have members of our profession who hold federal appointments not only at Washington, but at all the important seaports and also in England. Some of the States have veterinarians at the slaughter houses, to inspect the cattle before they are killed and the meat afterwards. A short time ago the Federal Government gave each State that had a university $15,000 for the purpose of making original investigations in the diseases of animals. Nebraska established a laboratory, and engaged a man for that purpose, the result of which you all are well aware of. What has Illinois done? Nothing. The $15,000 was given the University at Champaign and we as veterinarians have a right to demand that something be done with that money.

The success of our meetings lie entirely with the members themselves, in the interest they show in attendance and in participation in the active duties of the Association.

I sincerely hope that with our revised by-laws and new code of ethics, new life will be instilled into the members, that more interest will be taken in the working of the Association, and I also hope that each member will consider himself a committee of one to secure new additions to our membership, thus increasing our numbers till we have all the qualified practitioners in the State within the ranks of the Association.

I would also urge upon you the importance of becoming members of the United States Veterinary Medical Association, thereby assisting to make that body a truly national one. The State Associations can only hope to have a local influence, but the United States Veterinary Medical Association is bound to wield an influence that will be felt throughout the length and breadth of the land. I think it is only a question of time when it will be a requisite condition to qualify a man to become a member of that body, that he be a member in good standing in a State Association.

The benefits to be derived from these meetings are many; a man gets an opportunity to gain new ideas; it takes him

out of the old rut he has been running in; gives him a chance to get the dust blown off his best suit of clothes; he sees new faces, puts more money in circulation, and if he is not troubled with big head (not lumpy jaw) he will learn something; he enjoys himself and goes home with fresh vigor to again take up the task of life.

I tell you, gentlemen, in these days of microbes it is not safe for a man to stay away from a meeting, where he may learn something about that which is at the bottom of all diseases, for everything is "germs" now, even we ourselves are full of them, and to prove it, I will with your kind permission add something taken from the *Texas Health Journal*:

"Man, born of woman, is of few days and full of microbes. He standeth in the midst of Micro-Kock–I, and gnaweth on the hock-joint of the razor-back hog until filled with trichina. It has been said: 'God made man a little lower than the angels,' and he hath been a little lower ever since. In cities the food of man is stale vegetables, hydrant water and sewer gas; in the country he groweth 'phat' on pea soup and branch water; at other times he maketh himself sick on sauer-kraut and sendeth for the good physician, who giveth him ipecac and calomel until he cougheth his teeth out. Animals have instincts and man outstincts, neither of which smelleth like a tube rose.

"From teething to unteething is the longer life of man. After the latter he gummeth his soup and drinketh his dried beef. His younger days are filled with wind, but in his old age the wind is knocked out of him. He drinketh bug-juice until his nose shineth with a ten-candle-power, and he smoketh the vile weed until he snorteth—when the wind changes and he smelleth his own breath. Verily the seed of woman stone-bruiseth his heel and thumpeth his nose against the screen door. Yea, man is of but few days, and is filled with tanglefoot."

I beg to thank you, gentlemen, most sincerely, for the honor you conferred on me in electing me President of this Association for the past year. I wish also to thank the different members of the Programme Committee for their great

assistance in aiding me to place before you a programme which I feel will be both interesting and instructive.

The Secretary being absent no report was given.

A report from Dr. J. T. Nattress showed a cash balance on hand.

There being no committees to report, the President called on Dr. M. Wilson to read his paper on "Influenza."

After a brief discussion regarding the treatment, the discussion was closed on motion.

Article IV, Section 1, of the Constitution, which was revised at last meeting, was adopted on vote of yeas and nays.

The revised By-Laws, except Article IX, were also adopted.

On motion, Article IX of the By-Laws was laid over until next day.

After a ten-minute recess, the President called on Dr. G. Z. Barnes to read his paper on "Tetanus."

After discussion, relating almost entirely to the various forms of treatment, the discussion was closed on motion.

Dr. A. H. Baker was then called upon, and the subject he chose was the post-mortem appearance of the cattle disease, which Dr. Caswell, Dr. Williams and himself investigated in various parts of the State this past summer.

On motion, adjourned until next morning.

Nov. 18th, 1891.

The meeting being called to order at 10 A.M., the President called on Prof. McIntosh to read his paper on "Parturient Apoplexy."

After a lengthy discussion regarding the pathological cause and the treatment, the discussion was closed on motion.

Dr. Schoenleber was then called upon to read his paper on "Veterinary Agricultural Editorials."

After some remarks upon the subject by the members, the discussion was closed.

A letter was read from Dr. Williams, regretting his inability to be present, and tendering his resignation as a member of the Association on account of his being a non-resident of the State.

Dr. Williams' resignation being accepted, on motion of Dr. Stringer, seconded by Dr. Ramsey, he was made an honorary member.

The Secretary was instructed to write a letter to Dr. Williams, testifying sincere regret at his having to resign his active membership, and thanking him for his past labors in behalf of the Association.

Article IX of the By-Laws—the Code of Ethics—was read, and on motion of Dr. Ramsey, seconded by Dr. Delavergne, was adopted.

The meeting then adjourned until after dinner.

The afternoon session being called to order, Dr. Withers was called upon to read his paper on "The Use of Antiseptics."

After some remarks upon the use of antiseptics in the various surgical cases, the discussion was closed.

Dr. Lanigan then gave a case report.

J. A. McDonnell, M. D., was then called upon, and read an excellent paper on "The Veterinary Profession," and was followed by C. G. B. Klophel, M. D., who read an exhaustive article on "Tuberculosis."

A vote of thanks was extended to Drs. McDonnell and Klophel, and both were made honorary members, as a recognition of their endeavors to benefit the veterinary profession.

The following gentlemen were then proposed for membership: Drs. F. H. Anderson, (Ont., '89), Evanston; Otis Barnett, (Chic., '91), Edwardsville; Walter Allen, (Chic. '90), Dunlap; A. M. Story, (Ont., '91), Buda; F. L. Brown, (Chic., '89), Galesburg.

On motion of Dr. Stringer, seconded by Dr. Gunning, they were unanimously elected.

The following officers were then elected for the ensuing year: President, Dr. S. S. Baker; Vice-President, Dr. S. V. Ramsey; Secretary, Dr. M. Wilson; Treasurer, Dr. N. I. Stringer; Censors, Drs. Lanigan, Nattress and Walker.

The President appointed the following standing committees: Committee on Programme, Dr. Pyle, Schoenleber and

Story; Committee on Arrangements, Drs. Lanigan and Gunning; Committee on Legislation, Drs. Walker, Nattress and Pease; Committee on Membership, Drs. Stringer, Thomson and Alverson.

It was moved and seconded that a committee, consisting of Drs. Pyle, Schoenleber and Parkinson, see that the Code of Ethics be complied with by members of the Association, and report at each meeting. Carried on motion.

A proposition, signed by three members, to change Section 3, Article II, of the By-Laws, relating to the number of members necessary to form a quorum, from the present number (ten) to five, was laid on the table.

A vote of thanks was tendered the retiring officers.

The Association adjourned to meet in Peoria at the call of the Committee.

MATHEW WILSON, M.R.C.V.S.
Recording Secretary.

COMITIA MINORA U. S. VETERINARY MEDICAL ASSOCIATION.

A meeting of the Comitia Minora of the United States Veterinary Medical Association will be held at Hotel Royal, 6th Ave. and 40th St., New York, on Saturday, February 20th, 1892, 8 p. m.

Arrangements for the International Veterinary Congress at Chicago, 1893; and the place of meeting of the Association for 1892 will be considered, in addition to matters of routine business.

Suggestions and communications for the Comitia Minora should be submitted to the Secretary.

By order of the President,

W. H. HOSKINS, *Secretary.* R. S. HUIDEKOPER.

NOTICE.

The second annual meeting of the New York State Veterinary Medical Society will be held at the Vanderbilt House, Syracuse, N. Y., January 12, 1892.

The meeting will be called to order at 10 o'clock, A. M., January 12, and continue until all business is finished. All veterinarians throughout the State are earnestly requested to attend, as matters in which all are deeply interested will be brought up for discussion.

Remember the date, Tuesday, January 12, 1892.

N. P. HINKLEY, D.V.S., *Secretary*,
395 Ellicott Street, Buffalo, N. Y.

OBITUARY.

DR. GEORGE BRIDGES.

This most estimable man passed away yesterday at his home on Isaacs Street a little past the meridian hour. He was born in New York City, Nov. 1st, 1850. His parents dying in his early youth, he was sent to boarding school, and on arriving at age, embarked in business and went to Utah with a son of Brigham Young, but his love of animals, and especially the horse, led him to return to New York and enter the American Veterinary College. He came to Norwalk six years ago and opened an office, just prior to his graduation. His thorough mastery of his profession and his deep and tender sympathy for a dumb animal in distress, with his honest, genial, personal attributes, at once opened up to him a wide and successful professional business. He was never strong and his exposure and devotion to his profession soon began to tell upon his health and strength.

Early last year he became aware that consumption was threatening his life and on the 8th of last December he went to Aiken, S. C., and remained South till late this spring, when he returned home and to the devoted care of his wife and daughter. Here, fully conscious of his condition, he waited patiently and uncomplainingly the inevitable hour of his departure. Last fall he united with the First Congregational Church, with which his wife and daughter were already connected, and his religious faith and hope were his sure solace and support as he descended to the dark river of death, on

whose other shores he could hear his Saviour's welcome, "Well done, good and faithful servant, enter into the joy of your Lord." No man ever grew more rapidly into the confidence, respect and love of an entire community. His frank and honest nature and kindliness of heart won all other hearts, and living he was everywhere beloved and now that he is gone, he is as widely and sincerely lamented.—*From Norwalk (Conn.) Paper.*

DR. JOHN SUTTON.

The veterinary profession has lost one of its most enthusiastic members in the death of Dr. J. Sutton, on October 28th, at Kalamazoo, Mich. Although not a graduate of a veterinary college, he followed his chosen profession in a manner alike creditable to it and himself. During the war he became afflicted with deafness, which later on necessitated his leaving the veterinary college, after nearly completing the two years' course, having secured, during the junior year, first prize in anatomy. His death was due to stomach troubles, from which he was a great sufferer for several years.

NOTICE.

Dr. E. D. Roberts, of Janesville, Wis., has been appointed to succeed Dr. Atkinson, recently deceased, as State Secretary for Wisconsin of the United States Veterinary Medical Association.

POSITION WANTED.

A D.V.S. with hospital experience, wants position as assistant surgeon. Address

SABISTON & MURRAY, Publishers,

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